MINISTRY OF AGRICULTURE, FISHERIES AND FOOD

FISHERY INVESTIGATIONS
Series II Volume XXV Number 5

The breeding and wintering populations of the Oystercatcher (*Haematopus ostralegus* Linnaeus) in the British Isles

P. J. DARE

Fisheries Experiment Station
Castle Bank, Conway

LONDON: HER MAJESTY'S STATIONERY OFFICE
1966

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INTRODUCTION

THE various forms of Oystercatchers (Haematopodidae) constitute a small, monogeneric family of mollusc-eating shore-birds of quite distinctive appearance and specialized food habits. As a group, Oystercatchers have a wide, but disrupted, semi-cosmopolitan breeding distribution (Voous 1960). They breed around the coasts of much of Europe, North and South America, and Australasia, as well as inland in certain regions of Europe, western Asia and New Zealand. They do not breed, however, in very high latitudes, in southern Asia, or in tropical Africa, and are absent from many oceanic island groups.

The Oystercatcher of Europe and western Asia is *Haematopus ostralegus* Linnaeus. Its breeding range is virtually continuous from northern Russia to north-west France and includes most of the Baltic Sea area as well as the British Isles, Faeroe Islands and Iceland. In southern Europe, however, the distribution is highly discontinuous, breeding there being confined to the Atlantic coast of Iberia and to a few widely scattered localities along the northern shores of the Mediterranean from southern France to Asia Minor. In southern and eastern Russia a distinct, and probably relict, population extends over a vast inland range —from the Black Sea into central Asia — approximately coincident with the area formerly covered by the ancient Sarmatic Sea (Voous 1960, Witherby et al. 1940).

The winter range, which is reached from the more northerly breeding areas by large autumnal migrations, is strictly coastal and, for the north European populations, extends from the British Isles and the southern shores of the North Sea southwards to north-west Africa. Some Oystercatchers winter in high latitudes, but only on coasts washed by the relatively warm waters of the North Atlantic Current. In south-west Iceland several thousand birds now winter (Dr. F. Gudmundsson, pers. comm.). In Norway, however, they are very few in number although some occur even as far north as the Lofoten Islands (Dr. H. Holgersen, pers. comm.).

The population from southern Russia and central Asia winters round the Arabian Sea and down the east coast of Africa. In winter quarters, and during migration, Oystercatchers are highly gregarious and often form large flocks in contrast to their widely, and more or less territorially, dispersed breeding populations.

Like its close allies, the European Oystercatcher is a fairly large, robust wading-bird (of about 500 to 600 g body weight) adapted to feed on marine lamellibranchiate and gastropod molluscs. The diet is, however, at times very varied, and frequently includes annelids and small crustacea as well as insects and other invertebrates (Appendix I). The bill is typically chisel-shaped — being long, stout, laterally compressed and more or less blunted at the tip — and, together with other morphological adaptations (e.g. of the head and neck musculature), enables the Oystercatcher to exploit successfully an abundant food source (medium-sized bivalves and limpets of 10-60 mm shell length), which is not efficiently utilized by any other group of shore-birds. Oystercatchers also possess a range of prey-specific feeding behaviour patterns to cope with the various sizes and species of mollusc preys found under the widely fluctuating environmental conditions of the sea shore. Details of feeding behaviour have been well described by Dewar (1908, 1910, 1913, and 1915), Drinnan (1957, 1958), Tinbergen and Norton-Griffiths (1964), and Hulscher (1964).

In certain areas of north-west Europe *H. ostralegus* is a potentially important predator of intertidal stocks of the two lamellibranchs *Mytilus edulis* L. (edible mussel) and *Cardium edule* L. (edible cockle). In England and Wales the impact of large concentrations of Oystercatchers upon commercially fished beds of cockles has recently been assessed by Drinnan (1957), Hancock (1961), and Hancock and Urquhart

(1965). The resulting damage was demonstrated to be sufficiently great to warrant the Oystercatcher being designated a local pest. As a result of these investigations, Oystercatchers may now be killed by Fisheries Officers and other authorized persons in the following areas:— Morecambe Bay in Lancashire, Brancaster and Blakeney Harbours in Norfolk, and the Burry Estuary (Burry Inlet) in South Wales. In the Dutch Waddenzee, however, Hulscher (1964*b*) considers that the extensive predation of cockles by similarly large flocks of Oystercatchers probably does not constitute a very important mortality factor. Dewar (1922) demonstrated that captive birds could open oysters (*Ostrea edulis* L.) up to 6 cm long. Although oysters must now be only exceptionally taken in this country, *H. palliatus*, of the Atlantic coast of North America, feeds extensively on oysters (Tomkin 1947), presumably *Crassostrea virginica* Gmelin.

The investigations to be described in this paper are related to other recent work on the problem of reducing Oystercatcher depredations on commercial cockle stocks (Davidson, in press). The primary aims of this study have been to determine the size and distribution of both the breeding and non-breeding populations of Oystercatchers in the British Isles, and to examine any recent trends and the factors controlling population size. The origins and migrations of the birds causing shellfish losses, and the extent to which flocks intermingle or remain faithful to particular feeding grounds, will be described elsewhere.

THE BRITISH BREEDING POPULATION

SIZE AND DISTRIBUTION, 1960-65

The present breeding distribution of Oystercatchers in the British Isles is shown in Figure 1. The map, and the subsequent sections on the habitats, foods and mortality factors of breeding populations, have been compiled from the following sources of information: (a) published records in county or regional handbooks and in the reports of the many local ornithological and natural history societies; (b) information kindly supplied by regional representatives of the British Trust for Ornithology, by other local observers and by E. J. M. Buxton; (c) personal observations and (d) data from recoveries of ringed Oystercatchers and the nest record scheme kindly made available by the British Trust for Ornithology. These sources of information do not everywhere give a complete picture of the distribution, because large parts of Scotland and Ireland, for example, are not well covered by observers. Nevertheless, the overall distribution pattern is sufficiently clear, especially for England and Wales, for certain conclusions to be drawn. The basic data for each county or region are given in Appendix II.

MAIN FEATURES

British Oystercatchers are primarily coastal nesters, although many breed far inland in several areas of northern Britain. The coastal breeding range comprises mainly our northern and western shores where Oystercatchers extend out to colonize the remotest islands and skerries. Thus, they breed on North Rona, Sule Skerry, St. Kilda, and the Flannan Isles off north and west Scotland. Along the North Sea coast and around east and south-east Ireland on the other hand, the Oystercatcher is often scarce or absent as a breeding species, and it is only marginally present on the English Channel coast.

In England and Wales, and in eastern Scotland, the principal coastal breeding concentrations are mainly in nature reserves, many of which are on islands, e.g. Scolt Head and Blakeney Point (Norfolk), Skomer and Skokholm (Pembroke), Bardsey (Caernarvon), Newborough Warren (Anglesey), Walney Island (Lancashire), Farne Islands (Northumberland), and the Sands of Forvie (Aberdeen). The Scolt Head nature reserve, with 114 breeding pairs in 1964 (R. Chestney, pers. comm.) has almost certainly the largest single breeding concentration of Oystercatchers in the British Isles. Elsewhere in England notable numbers breed only in relatively undisturbed areas and some of these may incorporate small sanctuaries, e.g. Scilly Isles (Cornwall), Esk Estuary (Cumberland), and Medway Estuary (Kent).

Fig. 1. *The breeding distribution of Oystercatchers in the British Isles*, 1960–65.

Thickened coastlines and shaded inland areas indicate the main breeding range, over which scattered pairs and concentrations of less than ten pairs occur frequently. Symbols indicate large breeding concentrations. Outside the main range, groups of less than ten pairs and isolated pairs are also indicated. There is insufficient information to accurately indicate all breeding concentrations in the west and north of Ireland and Scotland.

Inland-breeding Oystercatchers range over three distinct regions in the highland zone of northern Britain. These are: (i) northern England and southern Scotland, extending from central Lancashire and the Yorkshire dales north through the southern uplands of Scotland; (ii) the Eastern Highlands, from the Forth valley to eastwards of the Great Glen and including most of the coastal lowlands of eastern Scotland; and (iii) northern Scotland, essentially Easter Ross, the eastern half of Sutherland, and Caithness.

Inland nesting occurs typically in areas where the rivers are comparatively long and slow-flowing, with resultant shingle beds scattered along their lengths, and where the surrounding valley lands are fairly open and often well cultivated. Such country is characteristic of all the above three inland breeding regions. Where, as throughout western Scotland and many of the larger Hebridean islands, rivers are short, swift, and pass through very rugged and wild mountainous country, Oystercatchers rarely penetrate inland.

POPULATION ESTIMATES

Our knowledge of the distribution and numbers of Oystercatchers breeding in the British Isles is summarized in the map (Fig. 1), Tables 1, 2, and 3, and Appendix II. The available information is brought together and presented in some detail in this paper in the hope that it may serve also as a useful basis for some future national survey of British Oystercatcher populations. For England and Wales only there is now sufficient information for a fairly close determination of population limits. For Scotland and Ireland, on the other hand, data are still so meagre that a minimum estimate of population size is all that can reasonably be attempted at this stage.

England and Wales

In general the amount of data available is inversely proportional to Oystercatcher abundance. Thus, for many counties where the species breeds less plentifully a reliable indication of local population size is usually obtainable from the relevant county literature. Where, however, Oystercatchers are much more numerous — as in west Wales, the Isle of Man, and northern England — published records are usually so inadequate that estimates have had to be based largely on other sources of information. These are: subjective estimates of abundance made by experienced local observers, and our own surveys of many of the more important breeding areas. To allow for errors inherent in any synthesis of such a heterogeneous mass of information the population estimates are given within fairly broad limits.

It is estimated (Table 1) that between 1 600 and 2 300 pairs of Oystercatchers breed around the coasts of England and Wales. Of this number approximately one quarter are in Wales where they are nowadays at all numerous only in the most remote areas (Anglesey, Lleyn and Pembroke) and, even there, mainly on islands. In England, too, the largest numbers breed on the least disturbed coasts of the extreme north-west and south-west, or in nature reserves in Norfolk. On the mainland of Cornwall, and in Devon, although long stretches of the rugged coasts are apparently suitable and still largely undisturbed, the Oystercatcher is an unexpectedly scarce breeder. The reasons for this scarcity are not known.

The inland breeders of northern England, which probably total 300-500 pairs (Table 2), are a new population which has developed only since ca. 1880 when Oystercatchers first began to nest inland in this region (see below). The measure of success of this recent colonization is indicated by the fact that the inland population is already about one fifth as large as the long-established coastal populations of England and Wales. It is also notable that in the area east of the Pennines Oystercatchers are now much more numerous inland than they are on the North Sea coast. This is strikingly evident in Yorkshire and it is

true also of Northumberland. In Durham, however, where the upland river valleys are mainly narrow, steep-sided and well wooded, there are far fewer suitable nesting sites (Buxton 1962), and consequently Oystercatchers are almost as rare inland as they are on the coast.

The total numbers of Oystercatchers breeding inland and on the coasts of England and Wales thus amount to between 1 900 and 2 900 pairs.

Table 1. *The numbers of Oystercatchers breeding on the coasts of England and Wales*, 1960–65

	Population limits (in pairs)			
	Minimum		Maximum	
Cornwall	150		250	
Devon	25		50	
Somerset	5		10	
Gloucester	0		0	
Dorset	5		15	
Hampshire	20		30	
Sussex	5		10	
Kent	60		70	
Essex	20		30	
Suffolk	50		60	
Norfolk	200		250	
Lincolnshire	15		25	
Yorkshire	1		3	
Durham	0		1	
Northumberland	50		70	
Cumberland	350		450	
Lancashire	125		190	
Isle of Man	100		150	
Cheshire	5		15	
		1 186		1 679
Flintshire	0		2	
Denbigh	0		0	
Caernarvon	60		100	
Anglesey	140		160	
Merioneth	20		40	
Cardigan	20		30	
Pembroke	225		300	
Carmarthen	0		1	
Glamorgan	1		5	
Monmouth	0		0	
		466		638
	1 652		2 317	

Table 2. *The numbers of Oystercatchers breeding inland in northern England*, 1960–65

River system	Counties	Population limits (in pairs) Minimum	Maximum
Yorkshire Dales	Yorkshire	45	80
Ribble	Yorks./Lancs.	30	50
Wyre	Lancashire	5	10
Lune	Lancs./Yorks./Westmorland	40	60
Eden	Cumberland/Westmorland	70	120
Lyne	Cumberland	10	20
Tees/Wear/Derwent	Yorks./Durham/Northumberland	1	5
Tyne	Northumberland	40	90
Coquet	,,	50	75
Aln	,,	2	5
Breamish	,,	10	20
		303	535

Scotland

Any attempt to assess the size of the Scottish breeding population is baulked at present by formidable problems: by the vastness and usually difficult terrain of the country, by the widespread distribution and abundance of its Oystercatchers, and by very sparse observer coverage. It is hardly surprising, therefore, that no previous estimates of mainland populations can be traced, although very useful census data have recently been obtained for some small island populations. In order to obtain at least a minimum estimate, recourse has been made to experienced local observers' subjective impressions of abundance, combined with sample data collected during our extensive surveys of riverain breeding populations. For most regions the estimates given here are based on observed density indices such as the average number of pairs per mile of coast or river. All the basic information and methods of deriving regional estimates are outlined in Appendix II.

Probably not less than 13 000 pairs of Oystercatchers breed in Scotland (Table 3), of which perhaps between a quarter and one fifth nest inland. Indeed, the actual population size could well prove to be as much as two or even three times this figure. Only in a few areas where Oystercatchers are less plentiful and more restricted in their distribution can an upper estimate of population be attempted with any confidence. Thus, the inland breeders of northern Scotland probably amount to 900-1 500 pairs, those of southern Scotland to between 500 and 750 pairs, whilst the east coast breeders south of the Moray Firth may total only 125 to 250 pairs. The scarcity of the Oystercatcher on this particular stretch of coast is in marked contrast to its abundance elsewhere and has been previously remarked upon by Baxter and Rintoul (1953). The reasons for this are uncertain, since many and varied stretches of apparently suitable shores, free from excessive disturbance, can be found all along this coast.

Ireland

The problems here are essentially the same as those encountered in Scotland, except that Oystercatchers rarely nest inland in Ireland, and similar methods are employed to derive a minimum estimate of the Irish breeding population (Table 3).

Probably not less than 4 000 — and perhaps up to 6 000 — pairs breed in Ireland, nearly all being found on the rugged and indented Atlantic and northern Irish Sea coasts. The much smaller and scattered breeding concentrations on the south and south-east coasts probably do not exceed a total of 250 pairs. It is doubtful whether more than 15 pairs nest inland in the entire country, these being around Lough Beg and Lough Neagh.

Table 3. *The numbers of Oystercatchers breeding in Scotland and Ireland;* 1960–65: *estimated minimum population levels*

Region		Minimum numbers of breeding pairs	
SCOTLAND			
	Coastal		
	Shetland	1 500	
	Orkney	1 500	
	Outer Hebrides	1 000	
	Inner Hebrides and Clyde Islands	2 000	
	Mainland: west and north (Solway Firth to Ross and Cromarty)	4 000	
	Mainland: east (Moray Firth to Berwick)	125	
			ca. 10 000
	Inland		
	Eastern Highlands	1 500	
	Northern Scotland	900	
	Southern Scotland	500	
			2 900
		ca. 13 000	
IRELAND			
	Coastal		
	west, north and north-east	4 000	
	east and south	150	
	Inland	5	
		ca. 4 000	

British Isles: Total

From Tables 1, 2 and 3 it is evident that the combined breeding population of England, Wales, Scotland and Ireland must exceed 19 000 pairs. It could well be as high as 30 000-40 000 pairs. Scotland is clearly the major breeding area for the British population; nearly three-quarters of our native Oystercatchers may be centred there. Ireland is also an important breeding area, whereas probably no more than 10% of our Oystercatchers nest in England and Wales.

The British population estimate may be compared with recent estimates of the numbers breeding in some other northern European countries:

Iceland: "I should be much surprised if the size of the population should be less than 10 000 pairs and I am even inclined to believe that it may be considerably bigger, even 20 000 to 30 000 pairs." (Dr. F. Gudmundsson, pers. comm.).

Faeroe Islands: Extremely abundant. A survey made by the writer in 1965 indicated a population of around 30 000 pairs, and certainly not less than 13 000 pairs, in these islands whose total land area is rather less than that of Shetland (Dare, in prep.).

Finland: ca. 600 pairs (Merikallio 1958).

Estonia: ca. 3 000 pairs, exclusively on the Baltic shores (Professor E. Kumari, pers. comm.).

Denmark: Probably ca. 5 000 pairs (N. O. Preuss, pers. comm.).

Germany: ca. 3 900-4 000 pairs on 21 of the Friesian islands; mainly in nature reserves (Goethe 1962, Dulz 1963, Vauk and Gräfe 1963).

Holland: Probably not less than 10 000 pairs now breed inland, whilst a further 3 000 pairs or more may nest on the Dutch Friesian Islands (J. B. Hulscher, pers. comm.).

Belgium: Probably under 100 pairs along a very short coastline. In 1956 a national survey revealed only 16-20 pairs (Verheyen 1957), but by 1962 there had evidently been a marked increase, for in that year 35 pairs nested in the main breeding area — a reserve — which had held 12 of the 1956 pairs (Lippens 1963).

Oystercatchers breed commonly in Sweden (Dr. K. Curry-Lindahl, pers. comm.) and abundantly along the 10 000 miles of the Norwegian coast (Dr. H. Holgersen, pers. comm.). In northern France, however, they appear to be restricted more or less to the north-west coast where they are, it seems, most plentiful in Brittany (Mayaud, Heim de Balsac and Jouard 1936). In the Channel Isles the Oystercatcher breeds commonly on most of the islands (Dobson 1952).

It is thus evident that the British Isles, and in particular Scotland, form one of the major breeding strongholds of the Oystercatcher in northern Europe.

BREEDING HABITATS

The nest-site requirements of the Oystercatcher are unspecialized and consequently the British population is distributed over a diversity of habitats in both its coastal and inland breeding ranges.

Coastal breeders are able to utilize for their nest-scrapes the following broad habitats: (i) sandy, shingle and gravel beaches both on exposed shores and along estuaries, firths and sea-lochs; (ii) sand dune areas; (iii) saltmarshes; (iv) niches and small ledges on rocky cliffs; (v) hollows in the bare rock surfaces of undercliffs, reefs and skerries; and (vi) the turf-covered tops of small islands. On islands and in sand dune areas Oystercatchers often breed in very close association with large colonies of terns (*Sterna* spp.) and predatory gulls (*Larus* spp.). On Skomer Island, Pembrokeshire, the writer has found nests of Oystercatchers within nine feet of occupied nests of the Herring Gull (*L. argentatus* Pontoppidan). Cliff nest sites may be on steep rock faces and up to 30 feet or more above a rocky foreshore down to which the parents usually take their chicks when only a few days old. Some pairs even nest in apparently suicidal places, on tiny ledges overhanging the sea and where there is never any foreshore (pers. obs., Skomer). Brood survival chances in such situations are probably very small. Indeed, Jones (1963) has described how, in three successive years, the chicks of a pair which nested in one such precipitous site in Cornwall fell to their deaths shortly after hatching.

The Oystercatcher is very adaptable in its utilization of nesting niches in the available habitat and, as a result, sometimes occupies very unusual sites. In the Medway Estuary of north Kent, where the Oystercatcher population is currently expanding rapidly, nests have recently been found on broken sea-walls, the eroded tops of nine-inch square wooden piles standing in the water, and even on the deck of a derelict barge. In Germany, Rittinghaus (1963) describes similarly odd nests placed on wooden jetties and other man-made structures on the shore. In Morecambe Bay, Lancashire, some pairs breed annually on the stone coping of the mainline railway embankment across a salt-marsh on which other nests are regularly washed out by high tides (D. G. Harrison, pers. comm.). In 1964 eight pairs had nests along 1 500 yards of banking and some nests were within nine feet of passing trains.

The inland breeders of northern Britain occupy an equal variety of habitats. Buxton (1962) has described how the initial colonization of northern England was made along the slower flowing reaches of the main rivers. Birds settled first wherever shingle beds occurred and many still breed on these inland 'beaches', as they do also throughout Scotland, whilst other pairs nest on the shores and islets of reservoirs and freshwater lochs. From these centres Oystercatchers have now spread out onto surrounding agricultural (pasture and arable) land and onto heaths and moorland, often several miles from water. In the Eastern Highlands some birds breed far up the hillsides, and Witherby et al. (1940) noted breeding up to 1 800 feet above sea level. In June 1965, however, A. J. Mercer (pers. comm.) found a brood at 2 100 ft

beside the upper Findhorn, Inverness-shire, and observed a pair at 3 200 ft on the higher slopes of Meall nan Tarmachan, near Ben Lawers, Perthshire. In Orkney and Shetland, too, Oystercatchers breed on the farmland and hills some way from the sea (E. Balfour, pers. comm.; L. S. V. & U. M. Venables, pers. comm.), just as they do in the Faeroe Islands (Dare, in prep.).

In the Scottish lowlands and in northern England Oystercatchers breed on all types of arable land, including fields of oats, turnips and potatoes. In Norfolk and Lincolnshire there has been a recent extension of the breeding range locally into coastal fields of cereals and sugar-beet, as well as on to the freshwater marshes around Breydon Water.

Inland breeders are also very adaptable in their nest site requirements and may occupy unusual situations. In the Eastern Highlands some Oystercatchers breed on rough heathy ground amongst the remnants of the Caledonian Forest, and on the damp fringes of the birch woods along Strath Spey and the Aberdeenshire Dee (Baxter and Rintoul 1953; pers. obs.). In Kirkcudbrightshire a pair has bred for three years in a disused roadside quarry (L. Roberts, pers. comm.).

In several areas Oystercatchers have nested between the lines of railway tracks which were in daily use. There are isolated records from Wirral, Cheshire (Hardy 1941), Yorkshire dales (A. Pilkington, pers. comm.); Ravenglass, Cumberland (A. Warburton, pers. comm.), and Blair Atholl, Perthshire (Baxter and Rintoul 1953). The Scottish pair was successful, whereas one bird of the Yorkshire pair was killed by a train. On this particular main line 150 trains passed daily.

In Holland, where there has also been a recent spread inland, Oystercatchers may breed among high bushes, shrubbery and in copses. Nests have also been found in such unusual sites as a beech wood, on pollard willows (up to 1·75 m above ground), on tree stumps, on top of a 2m wooden pole (cf. Medway Estuary), and even on the thatched roof of a barn (Haverschmidt 1946).

FOODS

A wide range of foods is taken by our breeding Oystercatchers according to the immediate habitat of each pair. Unless stated otherwise, the following general account is based on personal observations.

Populations breeding on rocky shores, including those of small rocky islands and skerries, feed primarily on limpets (*Patella* spp.). Some birds also forage extensively, and especially at high tide, on cliff sides and island tops wherever there are patches and slopes of vegetation. In such situations, earthworms and other soil invertebrates supplement the staple diet of limpets.

Oystercatchers nesting on beaches, in dunes, and on salt-marshes, rely mainly on adjoining sand and mud flats for their food supply. Shingle beaches are particularly barren and, apparently, are not colonized unless there is such a feeding ground nearby. The three principal foods in the former habitats are mussels, cockles and *Macoma balthica* (L.), whilst many polychaete worms may also be eaten. Locally, as in Holland (Hulscher 1964*a*), numbers of small shore-crabs (*Carcinus maenas* (L.)) are preyed upon (Tinbergen and Norton-Griffiths 1964). Undoubtedly other species of bivalves and small crustacea, which cannot readily be distinguished in the field, are also taken as opportunity affords.

Exceptionally, where Oystercatchers breed amongst a colony of terns, individual pairs may prey regularly upon terns' eggs. The Oystercatcher chicks of Bound Skerry, Shetland, were observed by Jamieson (1925) to be fed on a diet of limpets and terns' eggs. At Scolt Head, Norfolk, several "rogue" Oystercatchers may destroy up to 40 clutches of the Common Tern (*Sterna hirundo* Linnaeus) each year (R. Chestney, pers. comm.).

Inland-breeding Oystercatchers do not feed to any great extent on the riverain shingle beds where many of them nest. Instead, earthworms constitute the staple diet of these birds although quantities of insects and their larvae, as well as other soil invertebrates too small to identify in the field, must also be eaten. The terrestrial food species identified in the stomachs of birds which had been feeding in coastal fields out of the breeding season are listed in Appendix I.

PREDATORS AND OTHER MORTALITY FACTORS

The breeding success of Oystercatchers is subject to a wide variety of mortality factors. The degree of breeding success, and the incidence of any one particular factor, tends to vary greatly according to locality and also from year to year. No detailed studies of the breeding success of British populations have yet been published and, consequently, only a broad outline of this important aspect is possible. It should be noted that, although the Oystercatcher is single-brooded, lost clutches are normally replaced quickly and that some birds may produce two, or even three, repeat clutches if necessary.

The factors most seriously affecting the breeding success of coastal nesters are: (i) tide and storm damage, (ii) avian predators, and (iii) human disturbance. Many birds breeding on salt-marshes, and some on beaches, have their clutches washed away or chilled fatally by occasional very high tides and stormy weather. Losses may be widespread on the Morecambe Bay and Solway Firth saltings, for example, and occur almost annually during the period of the May spring tides (D. G. Harrison and L. Roberts, pers. comm.). Some of the Norfolk beach-nesting Oystercatchers may also lose clutches in this way quite regularly (R. Chestney and E. Eales, pers. comm.).

Carrion and Hooded Crows (*Corvus corone* Linnaeus) are probably the most important and widespread predators of both clutches and broods. On St. Kilda Ravens (*Corvus corax* Linnaeus) take Oystercatcher chicks (Williamson 1964). Locally, predatory gulls (*Larus marinus* Linnaeus, *L. argentatus* and *L. fuscus* Linnaeus) may cause considerable destruction, especially in those areas, e.g. Walney Island, Lancashire, where Oystercatchers breed amongst colonies of these gulls. In Orkney, Black-headed Gulls (*Larus ridibundus* Linnaeus) are noted predators of Oystercatchers' nests (K. G. Walker, pers. comm.). In other places, however, where crows and nesting gulls are both plentiful, such as Anglesey and the Pembrokeshire islands, the overall annual mortality from predation is not necessarily high (A. J. Mercer, pers. comm.; Buxton 1939; pers. obs.). This may be attributed not only to the incidence of repeat clutches but also to the effectiveness of the Oystercatcher's alarm and bold defensive behaviour.

In Orkney and Shetland, and perhaps also in a few other parts of northern Scotland, it seems likely that Great and Arctic Skuas (*Stercorarius skua* (Brünnich) and *S. parasiticus* (Linnaeus)) could be important predators of Oystercatchers. In Shetland, both L. S. V. & U. M. Venables (pers. comm.) and M. Sinclair (pers. comm.) have seen an adult Oystercatcher struck down and killed by a Great Skua, whilst on one of the Faeroe Islands a decrease in the Oystercatcher breeding population has been ascribed directly to a marked increase in the numbers of these two fierce predators and nest-robbers (Joensen 1963).

Very little is known about mammalian predators except that brown rats (*Rattus norvegicus* Berkenhout) take some clutches on Anglesey and Norfolk beaches (A. J. Mercer and R. Chestney, pers. comm.), whilst badgers (*Meles meles* (L.)) raid nests on the Solway salt-marshes at Caerlaverock (L. Roberts, pers. comm.). Foxes (*Vulpes vulpes* (L.)) must also account for some clutches and chicks on salt-marshes and in sand dunes, as they do at Ravenglass, Cumberland (M. Norton-Griffiths, pers. comm.). On North Ronaldsay, Orkney, K. G. Walker (pers. comm.) records that some clutches are eaten by sheep.

Human disturbance of Oystercatcher nesting haunts occurs on an ever-increasing scale around many parts of our coast and varies in intensity from slight to excessive. Populations breeding on beaches, in dunes and on small islands close to towns and holiday centres are naturally most vulnerable to disturbance; this may result in egg-stealing and in desertion or chilling of eggs and broods, or may facilitate predation by bolder crows and gulls. Locally, formerly large populations have declined steadily because of continued disturbance of the habitat, e.g. Glamorgan (H. Morrey-Salmon, pers. comm.), parts of Lancashire, and on Skye and Mull (Seton Gordon, pers. comm.).

In locally large and dense breeding populations, there is evidence of a mortality, due to disease or starvation, among young Oystercatchers at about the time of fledging. On Skokholm island, Pembrokeshire, M. P. Harris (pers. comm.) has recorded a considerable mortality in some years, due possibly to a form of puffinosis. At Scolt Head, Norfolk, a number of young birds are found dying in an emaciated

state each year under conditions indicating starvation (R. Chestney, pers. comm.). Post-mortem examinations have not revealed any causal organism and the deaths are recorded mainly on the outer beach of the reserve where the food resources may well be insufficient. Other broods, whose parents have access to the rich feeding grounds in Brancaster Harbour, normally remain healthy and enjoy a much higher fledging success.

Among inland-breeding populations the primary causes of breeding failure are: (i) river floods, (ii) avian predators, and (iii) human disturbance. In northern England and parts of Scotland, many Oystercatchers breeding on riverain shingle beds lose their nests and broods in the sudden spates to which many such rivers are prone after heavy rainfall. Locally, these losses can be virtually catastrophic (pers. obs.; many local reports). Predation by crows is widespread, and reports indicate that in many localities intense crow predation is a major cause of breeding failure. Doubtless other avian, as well as some mammalian, predators must also take their toll of eggs and broods, but very little has been recorded. Many inland breeders are also clearly liable to considerable interference from routine agricultural operations, whilst birds nesting along certain stretches of river and loch may experience unintentional but severe disturbance from the activities of fishermen, campers and, occasionally, gravel extractors (pers. obs.).

Ringing recoveries (Dare, in prep.) show that many adult Oystercatchers must die during the breeding season. The cause of death is seldom known but there is evidence that some are killed by colliding with obstacles (wires, cars, and trains) and others from becoming entangled in cast sheep's wool. In the Faeroe Islands I was informed that the local Oystercatchers frequently become ensnared in wool during the latter part of the breeding season, sometimes fatally. In Shetland too, sheep's wool is a hazard to which Oystercatchers are most vulnerable. With some birds the legs eventually become bound together so that they cannot walk (J. Peterson, pers. comm.); R. Tulloch (pers. comm.) has also recorded mortality from this cause, since Oystercatchers recently began to invade the land.

RECENT CHANGES AND TRENDS

Although the overall pattern is complicated by opposing trends in different areas, the British Oystercatcher population as a whole is currently undergoing a phase of expansion. This is indicated by (a) an extension of range inland to previously unoccupied habitats in northern England and southern Scotland, (b) increases in breeding populations in various parts of northern Scotland, and (c) a recolonization of former coastal breeding sites in eastern England. These gains are being offset to a small extent by some local contractions of range, mainly in Wales. In Ireland, the little information available suggests that Oystercatchers are spreading to new haunts on the east and south-east coasts.

The records, although leaving much to be desired, are in general sufficient to demonstrate the main trends and to reveal the major causes of the population changes during the last 150 years. These can then be compared with recently recorded changes in Oystercatcher populations elsewhere in north-west Europe.

England: Coastal

At the start of the 19th century, Oystercatchers were breeding around virtually the entire coast of England. They were not necessarily common everywhere and, indeed, were apparently absent from Hampshire (mainland), and from much of Durham and Yorkshire where the coasts have never been very attractive to Oystercatchers. At that time Oystercatchers did not breed inland anywhere in England.

During the 19th century a widespread and rapid decline occurred around the east and south-east coasts, in Cheshire and in South Lancashire. In Sussex the decrease may have started even earlier, in the mid-17th century (Walpole-Bond 1938). This decline was caused by three factors:— (i) the taking of eggs and adults for food by local fishermen and others (in Sussex, Walpole-Bond 1938; Humber area, Cordeaux 1872; and doubtless elsewhere); (ii) industrialization and urban development of the coast (south Lancashire and the Fylde, Cheshire and Durham especially); and (iii) a general increase in human disturbance.

Probably in most areas a combination of all three factors contributed to the decrease in numbers.

It may be worth noting here that at Walney Island, north Lancashire, large numbers of Oystercatchers used to be netted for food. According to Macpherson (1892) old records show that, in this area, this species was regarded as a choice table-bird in the early 17th century. Indeed, the fishermen of Morecambe Bay continued the traditional practice of netting wintering birds for food up to ca. 1955.

By the late 19th century the Oystercatcher had become a rare breeding bird in east and south-east England:— in Sussex even by 1800 (Walpole-Bond 1938), in Norfolk by 1870 (Stevenson 1870), in the Humber area* by 1872 (Cordeaux 1872), in Essex by 1890 (Christy 1890), in Suffolk by 1890 (Ticehurst 1932), and in north Kent before 1909 (Ticehurst 1909). In south Kent it was extinct by 1890 (Ticehurst 1909) and it had ceased breeding in Cheshire before 1900 (Coward and Oldham 1900) and in Essex before 1929 (Glegg 1929). In Lancashire, south of the Ribble, Mitchell (1885) noted that Oystercatchers were decreasing on the sandhills of Southport and Formby though, in fact, a small breeding group has survived up to this day; in the Fylde district, however, the Oystercatcher was practically extinct by 1953 (Oakes 1953).

By about 1920 the English breeding population had reached its lowest level. However, with the growth of bird protection, and particularly with the establishment of the two sanctuaries at Scolt Head and Blakeney Point, the Oystercatcher began to recolonize the north Norfolk coast in the 1920s, and by 1930 Riviere (1930) was able to note that it had increased "very considerably". On this coast the rate of increase has been very striking. At Scolt Head, the population grew from seven pairs in 1924 to 114 pairs in 1964 (R. Chestney, pers. comm.). At Blakeney, where only one pair bred in 1906 (Riviere 1930), numbers increased from six pairs in 1924 to around 85 pairs by 1963 (E. Eales, pers. comm.). Nowadays, some 200 to 250 pairs breed along this north Norfolk coast of which approximately three-quarters reside in these two reserves.

Elsewhere, too, diminishing persecution enabled Oystercatchers to re-establish themselves — in south Kent from 1927 onwards, though in very small numbers (Harrison 1953), in Suffolk sometime after 1932, and in Cheshire in 1936 (Hardy 1941). Between 1938 and 1945, and perhaps largely due to enhanced protection from disturbance as a result of war-time public restrictions, Oystercatchers resumed breeding in Essex and Sussex, but they first bred on the mainland of Hampshire in 1934 (Cohen 1963). In north Kent their establishment occurred upon the Medway islands being abandoned for cultivation and becoming derelict after storm damage to the sea-walls in 1938.

Since 1945 the success of recolonization has been increasingly influenced in some areas by growing human disturbance of nesting habitats, so that wherever breeding populations are still very small they are unlikely to be able to expand much further coastwise. This situation is especially true of Sussex and south Kent and probably applies also to Cheshire, south Lancashire, and Lincolnshire. On the Yorkshire coast there has never been any recovery in numbers, and today no more than three pairs breed beside the Humber Estuary. The most notable population increases have all occurred either in nature reserves (Norfolk) or on the less accessible stretches of coast such as the saltmarshes and estuarine islands of Essex, Suffolk and north Kent. In Essex the population rose steadily from less than 10 pairs in 1945 to nearly 30 pairs by 1965. In Suffolk where, in 1932, the Oystercatcher was only an occasional breeder (Ticehurst 1932) some 20 to 30 pairs were nesting by 1950 and about 50 pairs by 1965 (G. B. G. Benson, pers. comm.). In the Medway Estuary of Kent where, before 1945, only a few pairs were nesting (Gillham and Homes 1950), some 16 pairs bred in 1950 and 53 pairs in 1961, with a further 10 pairs in adjacent areas. In Hampshire a small population (ca 12 pairs) has become established since 1934 along the salt-marsh areas of the West Solent opposite the Newtown River, on the Isle of Wight, where an increase in breeding numbers was reported between 1950 and 1953.

* They are said to have bred formerly in "great numbers" around the Humber Estuary (Cordeaux 1872), in large numbers in the Thorpe district of Suffolk (Ticehurst 1932) and "not uncommonly" in Essex (Christy 1890)

Around the coasts of south-west and north-west England, and Northumberland, no marked changes in numbers and distribution have been recorded except for an increase in the Farne Islands nature reserve (Watt 1951). It is to be expected, however, that increasing disturbance will inevitably cause a gradual contraction of the range in these three regions.

One of the most notable features of the recolonization process has been a recent and widespread tendency for Oystercatchers to nest in coastal fields, as they do in Holland and Belgium (see below). In Cheshire re-establishment took place in 1936 on the marshes beside the Dee Estuary and along the southern banks of the Mersey Estuary, and the small population has remained confined to these two limited areas. In south Lancashire, however, isolated pairs of Oystercatchers have begun breeding, since 1950, on farmland, colliery 'flashes', a disused aerodrome, and, up to ten miles or more from tidal waters, in the area between Altcar and Salford (Buxton 1962). At the same time breeding has occurred in coastal fields at several places on the north Norfolk coast from Cley to the Wash. In south Norfolk up to five pairs now nest annually near Breydon Water, on arable fields and fresh-water marshes beside the rivers Bure and Yare. Some of these pairs may be as much as nine miles from the sea. Between 1950 and 1957 up to three pairs bred, 1½ miles inland, near Horsey Mere on the fringe of the Norfolk Broads. In Suffolk, between Benacre and Minsmere, isolated pairs breed in arable fields and on the edge of heathland close to the shore (G. B. G. Benson and H. E. Axell, pers. comm.). In north Lincolnshire breeding has occurred two miles inland from the Humber Estuary in potato and sugar-beet fields (Smith and Cornwallis 1955). In Cumberland, Stokoe (1962) records that Oystercatchers now breed increasingly in fields near the coast and, near Ravenglass, nesting occurs on arable land a quarter-mile from the Esk Estuary (A. B. Warburton, pers. comm.). Oystercatchers also nest in fields reclaimed from the Kent Estuary in Westmorland (D. G. Harrison, pers. comm.). On the Northumberland coast, in 1954, a pair bred a half-mile inland in a turnip field near Monk's House. On Anglesey, nesting has occurred up to five miles inland on pasture and arable land (Walker 1956; A. J. Mercer, pers. comm.).

England: Inland

During the late 19th century, by which time coastal Oystercatcher populations in east and south-east England had already declined drastically, there began in north-west England and south-west Scotland a remarkable extension of the breeding range inland. The pattern and course of this event have been recently documented by Buxton (1962) who showed that the pioneers spread along the shingle beds of the main rivers flowing into the Solway Firth during the period 1880 to 1910. The subsequent spread into northern England continued rapidly by way of the main river systems until it crossed the Pennine watersheds into Northumberland and Durham and penetrated far down the Yorkshire dales. The Solway Firth was the prime source of this movement, although in later years Lancashire and Yorkshire may have been settled partly by birds coming up from Morecambe Bay. There is no evidence of any inland spread from the north-east coast, where the Oystercatcher has apparently never been a plentiful breeding species. At a later stage in their colonization Oystercatchers began to disperse away from riverain shingle beds to nest on surrounding farmland sometimes a mile or more from water.

There is no indication yet that this extension of range is slowing-up. In 1954 Oystercatchers bred for the first time within the Lake District, at Bassenthwaite Lake (Stokoe 1962). By 1951 they were across the Vale of York on the R. Rye, on the southern fringe of the North Riding moors (Buxton 1962). They have since bred there and also on the R. Riccal close by. At the southern end of the range, Oystercatchers were seen in June 1956 in the Goyt Valley, Cheshire-Derbyshire border, but nesting had not been proved there up to 1960 (Buxton 1962).

Scotland: Inland

Concurrent with their extension into northern England Oystercatchers also colonized the rivers of the southern uplands of Scotland, from Galloway and Ayrshire to Roxburghshire and the Lothians, eventually crossing the watershed of the Pentland and Moorfoot Hills to breed beside waters flowing into the Firth of Forth (Buxton 1962). The spread has continued since Buxton's 1958-59 survey. A "slight" increase has occurred in the Lothians (R. W. J. Smith, pers. comm.) and breeding has recently taken place in new areas of Roxburghshire (Medlicott 1963). In Dumfries-shire, in 1963, I was informed by a local farmer that numbers were still increasing along the Water of Ae.

In the Eastern Highlands large numbers of Oystercatchers have been breeding far inland for centuries beside the rivers and lochs as well as on farmland well away from water (Baxter and Rintoul 1953). But, as Buxton (1962) has pointed out, owing to the antiquity of the habit and to a scarcity of observers it is not possible to say whether there has been any recent general change in numbers in this region.

In northern Scotland, where Oystercatchers nest inland much less commonly, there has been an increase in breeding records this century, though whether this reflects an actual population increase or merely greater ornithological activity is uncertain. Buxton (1962) considered there was some suggestion of a slight increase in recent years and certainly there is no evidence to the contrary.

Scotland: Coastal

In general, coastal-breeding Oystercatchers have probably been decreasing in eastern Scotland for a long time, whereas there has been a marked increase this century in many island populations off the north and west coasts.

For the east coast, information is available only for the Firth of Forth area. Rintoul and Baxter (1935) considered there was some indication of a decrease on the shores of East Lothian, whilst only occasional nesting was known in Fife. Since then Oystercatchers have ceased breeding in Fife, due to excessive public disturbance (G. Dick, pers. comm.), but small numbers remain on the Isle of May and other islets at the entrance to the firth (Eggeling 1956, R. W. J. Smith, pers. comm.). In East Lothian only occasional breeding attempts are still made on the mainland (R. W. J. Smith, pers. comm.). Elsewhere up the east coast, and around to the Moray Firth, the Oystercatcher is a rather scarce breeder and is liable to disturbance from the numerous fishing ports. The only notable breeding concentration on this long coastline is in a nature reserve, Sands of Forvie, Aberdeenshire.

By contrast, there has been a pronounced increase, since ca. 1920, in the breeding populations of Oystercatchers throughout the northern isles, with a spread inland onto both agricultural land and many stretches of moorland. In Orkney, E. Balfour (pers. comm.) states that Oystercatchers have increased "enormously" over the past 40 years whilst, in Shetland, R. Tulloch and J. Peterson (pers. comm.) both comment that the species has been steadily increasing in the last 20 or 30 years. On Fair Isle, a similar increase and spread inland this century onto hill ground has been reported (Davis 1963).

Information from the western isles is, not surprisingly, sparse. However, the population of St. Kilda increased from under 50 pairs in 1939 (Nicholson and Fisher 1940) to ca. 55 pairs in 1957 and to ca. 75 pairs by 1963 (Williamson 1964). On North Rona, where only eight pairs were found by Harrisson (1932), 15 pairs were breeding in 1936 (Ainslie and Atkinson 1937) and probably ca. 20 pairs in 1958 (Bagenal and Baird 1959). On the other hand, there has been a noticeable decrease in the Isle of Skye and on Mull since the 1930s which Seton Gordon (pers. comm.) attributes to a rapid expansion in the number of tourists visiting these islands. Elsewhere, however, on the sparsely inhabited west coast of Scotland the bulk of the large Oystercatcher breeding population has been remote from public disturbance and may remain so for many years.

Wales

It seems certain that Oystercatchers formerly bred around the entire coast of Wales and as far up the Bristol Channel as Denny Island, Monmouthshire (Ingram and Salmon 1963). They have never bred inland, however, except occasionally on Anglesey. During the 19th century, although no records can be traced to confirm this, Oystercatchers must have been driven away by growing public disturbance from virtually the whole of North Wales between the Dee Estuary and the Menai Straits, for this coast has many eminently suitable breeding beaches. Today, the area is so completely overwhelmed and despoiled by the holiday industry that regular breeding is confined to the cliffs on the Great Orme.

A decrease in breeding populations is continuing everywhere on the mainland of Wales. Around Cardigan Bay increasing disturbance is causing a steady decline in Merioneth and Cardigan (W. M. Condry, pers. comm.), and perhaps also in the Lleyn Peninsula of Caernarvonshire. Likewise, the population on the Pembrokeshire coast was probably larger and more widely distributed 50 years ago than it is today. In east Glamorgan a former population of 70 to 80 pairs in ca. 1910 has been reduced to a tiny remnant by disturbance and habitat destruction, the decrease being most rapid since 1950 (H. M. Salmon, pers. comm.).

The last remaining strongholds of Welsh Oystercatchers are all on islands, two of which are nature reserves: Skomer and Skokholm (Pembrokeshire), Bardsey (Caernarvonshire), and Anglesey. On both the Pembrokeshire islands the populations have increased in recent years, e.g. on Skomer from 36 pairs in 1946 (Buxton and Lockley 1950) to 62 pairs in 1964 (pers. obs.). However, on Skokholm M. P. Harris (pers. comm.) considers that the population has probably reached its upper limit. On Anglesey, where the population may be in the process of re-distributing itself as public disturbance spreads, the breeding stock of the Newborough Warren nature reserve has risen sharply in the few years since the reserve's establishment (A. J. Mercer, pers. comm.).

Ireland

Information about the coastal breeding population in Ireland is very meagre. The only recorded changes in distribution refer to the east and south-east coasts where, according to Ussher and Warren (1900) and Kennedy et al. (1954), few Oystercatchers bred and these were confined to islands off Co. Wexford and Dublin. Since then, however, Kennedy (1961) has observed that the Oystercatcher now breeds regularly in Dungarvan Bay, Co. Waterford, and also that it has recently been nesting on the mainland of Wexford, Wicklow and Louth.

Other European countries

There has been a recent extension inland of the breeding range of Oystercatchers in Holland, north-west Germany, Denmark and in southern Sweden (Voous 1960).

In Holland, where Oystercatchers and other waders are quick to exploit the new lands reclaimed from the Ijsselmeer and Zuider Zee, Haverschmidt (1946) recorded that Oystercatchers had spread far inland since ca. 1920, and were breeding in places where formerly they were quite unknown. In southern Holland Oystercatchers nest on the polders beside the Schelde Estuary (Maebe and van der Vloet 1956, Suetens et al. 1961). In Belgium, as elsewhere, Oystercatchers have responded quickly to protection and they now breed in coastal pastures and on polder land, although the total population for the country is still small (Lippens 1963, Verheyen 1957). It thus appears that the recent English records of nesting in coastal fields in East Anglia and the north-west are following the pattern of the inland spread in the Low Countries rather than that of the colonization of highland Britain.

No marked population changes seem to have been recorded in northern France, or in Finland, Norway, or the Faeroe Islands. In Iceland, however, a prominent extension of range by Oystercatchers (and by

other species) has been evident since ca. 1920 (Gudmundsson 1951). There, Oystercatchers are colonizing the previously almost unoccupied north and east coasts. This sudden spread is attributed to the pronounced amelioration in the climate which has been taking place this century and which has been particularly rapid since 1920.

THE WINTERING POPULATION OF THE BRITISH ISLES

NUMBERS AND DISTRIBUTION, 1963-65

THE distribution of wintering Oystercatchers in the British Isles in recent years is shown in Figure 2. This map, and the related sections on the habitats, foods and mortality factors of the wintering population, have been compiled from the following sources of information: (a) published records in county or regional handbooks and in the reports of local ornithological and natural history societies; (b) counts and surveys made by myself and by my colleagues P. E. Davidson and A. J. Mercer; and (c) information kindly supplied by regional representatives of the British Trust for Ornithology and by other local observers. These sources of information give a fairly complete picture of the winter distribution even though the remoter areas, especially of Ireland and Scotland, are sparsely covered by observers. It is believed, however, that all but some of the less important wintering haunts have been included, these being mainly on the west coast and islands of Scotland and Ireland.

The distribution map (Fig. 2) indicates all haunts which are known to regularly support more than 100 Oystercatchers in winter. For the purposes of this study "winter" comprises the two-month period between late November and late January when migration studies (Dare, in prep.) show that the population is most settled in its winter quarters and normally undertakes no more than small, and mainly local, movements. This survey also refers essentially to the two winters of 1963-64 and 1964-65, for which the best coverage was achieved and during which the overall population was apparently relatively stable. The basic data for each county or region are given in Appendix III, whilst the methods of assimilating the data from each area are described below in the various regional sections.

MAIN FEATURES

The wintering range of Oystercatchers in the British Isles is strictly littoral except in a few areas where small numbers of birds may spend part of their time in coastal fields. Otherwise, the species is no more than a vagrant inland at this season.

Although in reality few stretches of our coastline are entirely without Oystercatchers, they are scarcest along great lengths of the North Sea and English Channel coasts, in western Ireland and in western Scotland and the isles, whilst the bulk of the wintering population is concentrated in a comparatively small number of haunts. These centres of population are found primarily around the shores of the north Irish Sea, in South Wales, the approaches to the Thames Estuary, in The Wash, and about the entrances to the firths on the east coast of Scotland. It will be seen that many of the centres fall close to a line oriented approximately N.N.E.-S.S.W. joining the Scottish east coast with Devon and Cornwall. The significance of this feature will become apparent in a later paper on Oystercatcher migrations around our shores (Dare, in prep.).

There are probably no more than 80 to 90 haunts in the British Isles which regularly support more than 100 Oystercatchers each winter (Appendix IV). Of these, only 35 haunts support more than 500 birds and 21 support more than 1 000 birds. Four major wintering grounds are immediately apparent: (i) Solway Firth, Scottish border, (ii) Morecambe Bay, Lancashire, (iii) Carmarthen Bay (east side), South Wales.

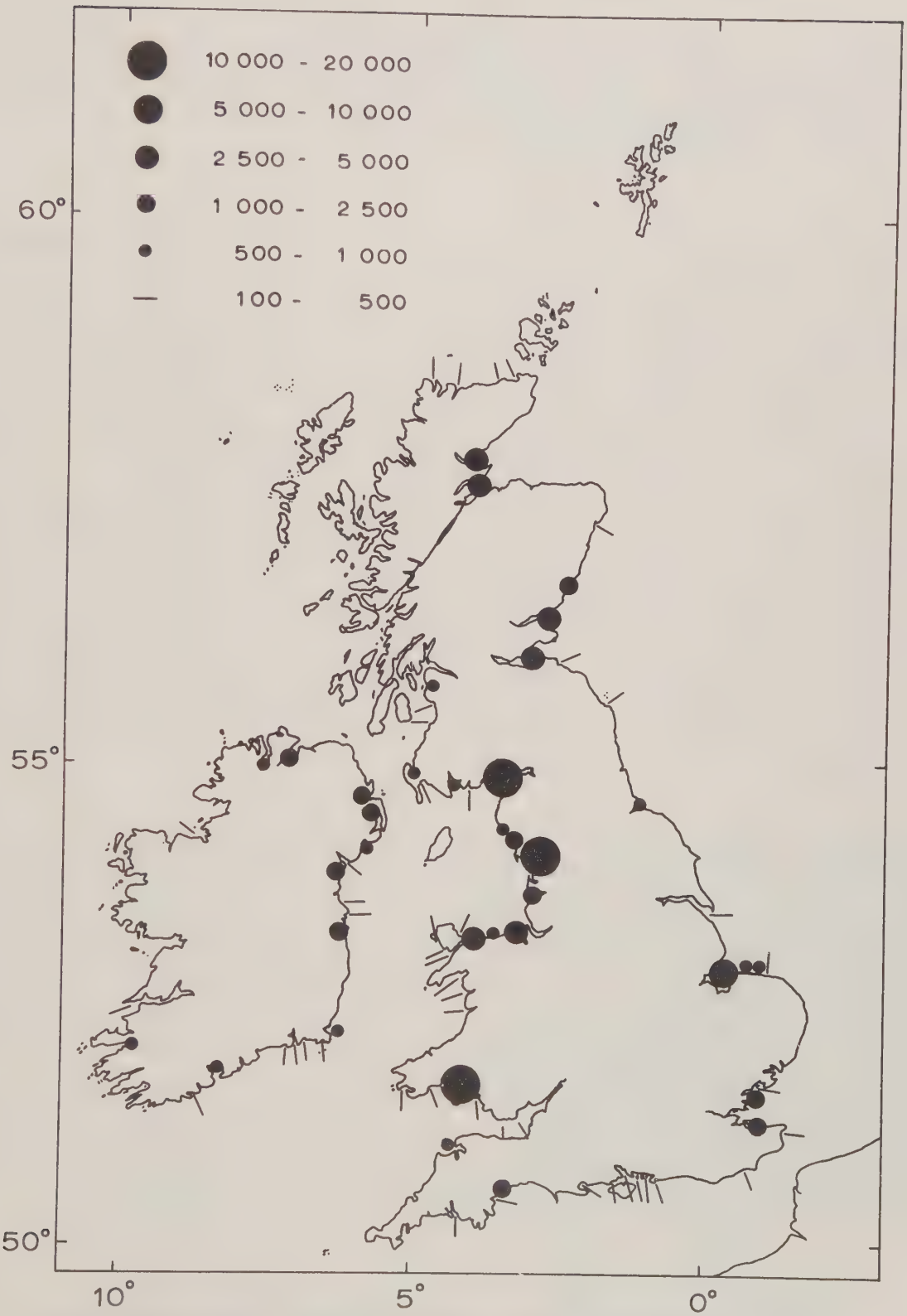

Fig. 2. *The main wintering haunts of Oystercatchers in the British Isles,* 1963–65. *The population limits indicated are those for December and January.*

and (iv) The Wash, East Anglia. The first three grounds regularly hold 10 000 to 20 000 Oystercatchers during the winter, whilst between 5 000 and 10 000 birds occur in The Wash. The Carmarthen Bay wintering ground comprises mainly the Burry Estuary (with 8 000-14 000 birds normally) and the adjacent composite estuary formed by the Taf, Towey and Gwendraeth rivers.

POPULATION ESTIMATES

England and Wales

Published records in county reports are in general an adequate guide to the numbers of Oystercatchers wintering in the many lesser haunts of southern and eastern England. Where recent records are lacking, however, earlier information recorded over the last 10 years has sometimes been used for localities where no significant changes are apparent. Data for the major wintering areas of Wales and north-west England have been obtained almost entirely from our own surveys, as no useful published information is available. Thus, frequent estimates were made of the populations in Morecambe Bay, north Wales, and the Burry Estuary, whilst the Solway Firth was thoroughly surveyed once each winter. In addition, occasional surveys covered virtually the entire coasts of west Wales, southern England, and East Anglia. The population in the Dee Estuary was counted monthly on our behalf by J. C. Gittins.

Any overall population estimate based on such varied sources of information is liable to error from, for example, incomplete observer coverage, inherent observer differences in estimating numbers, and from intermittent local flock movements. Populations are therefore estimated here only within fairly broad limits. More precise values could be obtained only by a synchronized national census each month.

Our knowledge of the distribution and numbers of Oystercatchers which wintered in England and Wales between 1963 and 1965 is summarized in the map (Fig. 2), Table 4, and Appendix III. The table shows that the wintering population was of the order of 50 000 to 100 000 birds, the counties with the largest numbers being Lancashire, Cumberland, Glamorgan, Carmarthen and Norfolk. It should be noted that in most areas considerably greater numbers of Oystercatchers usually occur at times during the autumn migration period.

Scotland

Published records of the wintering numbers in Scotland are almost non-existent and the estimates here are based largely on our counts in the Solway Firth and on a survey of the south-west and east coasts made in January and early February 1965. Additional information on flocks in northern Scotland, Tay, and Forth was kindly supplied by local observers. For the generally unsuitable west coast and the isles, where Oystercatchers are far scarcer in winter than during the breeding season (Baxter and Rintoul 1953), the estimates have been derived from close study of topographical maps allied with personal experience of the numbers to be found along similar rugged coasts in Wales and south-west England. More detailed observations on these remote shores, though desirable, are clearly well-nigh impossible. Nevertheless, it seems unlikely that any important wintering ground has been overlooked.

Because of the sparse observer coverage the Scottish estimates (Table 5) are expressed on a regional rather than a county basis. The best available estimate of the Scottish wintering population is 25 000 to 50 000 Oystercatchers, with the largest concentrations occurring in the Solway and the east coast firths (Fig. 2). This population is therefore approximately half as big as that of England and Wales.

Table 4. *The numbers of Oystercatchers wintering in England and Wales*, 1963–65

	Usual population limits	
	Minimum	Maximum
Cornwall	1 000	2 500
Devon	2 500	5 000
Somerset	250	500
Gloucester	0	50
Dorset	250	500
Hampshire	500	1 500
Sussex	500	1 000
Kent	2 500	3 500
Essex	2 500	3 500
Suffolk	100	250
Norfolk	5 000	10 000
Lincolnshire	1 500	4 500
Yorkshire/Durham	500	1 000
Northumberland	500	1 000
Cumberland	8 000	12 000
Isle of Man	500	1 000
Lancashire	13 000	17 000
Cheshire/Flintshire	3 000	5 000
Denbigh	500	1 000
Caernarvon	3 000	5 000
Anglesey	1 000	2 000
Merioneth/Cardigan	1 000	2 000
Pembroke	250	500
Carmarthen/Glamorgan (Gower)	9 000	16 000
Glamorgan (except Gower)	500	1 000
Monmouth	100	250
	57 450	97 550

Ireland

There are no published records of wintering numbers in Ireland and the estimates given here are based almost entirely on the results of a single national survey of all the main Irish haunts made in December 1965 by the writer. Additional information for some localities was supplied by a few local observers. The methods of estimating numbers on the many unsuitable stretches of coast, where Oystercatchers are scarce in winter, were the same as those previously employed for western Scotland.

Table 5. *The numbers of Oystercatchers wintering in Scotland*, 1963–65

	Usual population limits	
	Minimum	Maximum
Berwick	100	500
Firth of Forth	3 000	4 000
Firth of Tay	2 000	6 000
North-east coast (Arbroath–Lossiemouth)	2 000	3 500
Moray Firth	5 500	9 000
Sutherland/Caithness	2 000	4 000
Orkney/Shetland	500	1 000
Outer Hebrides	500	1 000
Inner Hebrides	1 000	2 000
West coast (West Ross–Firth of Clyde)	2 500	5 000
South-west coast (Galloway–Solway Firth)	7 000	13 500
	26 100	49 500

Table 6. *The probable numbers of Oystercatchers wintering in Ireland,* 1963–65

	Usual population limits	
	Minimum	Maximum
East coast	6 000	15 000
South coast	2 000	5 000
West coast	2 000	4 000
North coast	2 000	4 000
	12 000	28 000

If the pattern of Oystercatcher distribution and numbers recorded in December 1965 was typical of recent winters, and there is no reason to consider otherwise, then the estimated Irish wintering population (1963-65) amounts only to between 10 000 and 30 000 birds (Table 6). However, by virtue of its geographical position and its usually mild winter climate, Ireland must assume much greater importance as a temporary refuge for Oystercatchers driven southwards and westwards from Scotland, north-west England, or Wales by prolonged severe frosts. At such times the population might easily be doubled.

British Isles: Total

From Tables 4, 5 and 6 an estimate of between 95 000 and 175 000 Oystercatchers is obtained for the combined wintering population of the British Isles. Unfortunately, no comparable estimates for any other major European wintering areas can be traced, although there is evidence that the numbers wintering in the Dutch Waddenzee may exceed the entire British population. On certain of the Friesian Islands flocks of up to 30 000 Oystercatchers winter regularly (Rooth 1960, Tanis 1963). In August 1963, 163 000 Oystercatchers were counted in a two-day census of the whole Waddenzee area and numbers are even higher in winter (J. B. Hulscher, pers. comm.).

The proportions of the total wintering population of the British Isles which are found on the different coasts are shown in Figure 3. For this map the coastline has been divided into 12 more or less natural topographical regions, the boundaries and populations of which are listed in Table 7. It must be stressed that because of many imperfections in the data sources the quoted population values should be regarded as general orders of magnitude rather than actual population levels. These figures are, however, sufficiently accurate for present comparative purposes.

It is clear that the northern Irish Sea constitutes the major wintering area, to which around 40% of the Oystercatchers resort, whereas the very long coastlines of the English Channel, north-east England, northern and western Scotland, and western and southern Ireland are relatively unimportant. When the distribution of the wintering population between the main haunts is examined (Fig. 2 and Appendix IV), it is found that approximately a third of the entire population is concentrated in but three centres, namely, the Solway Firth, Morecambe Bay, and Burry Estuary, whilst two thirds of the wintering Oystercatchers are shared among no more than 21 haunts. The reasons for such a predominantly clumped distribution pattern become readily apparent upon consideration of the habitat and food requirements of the species.

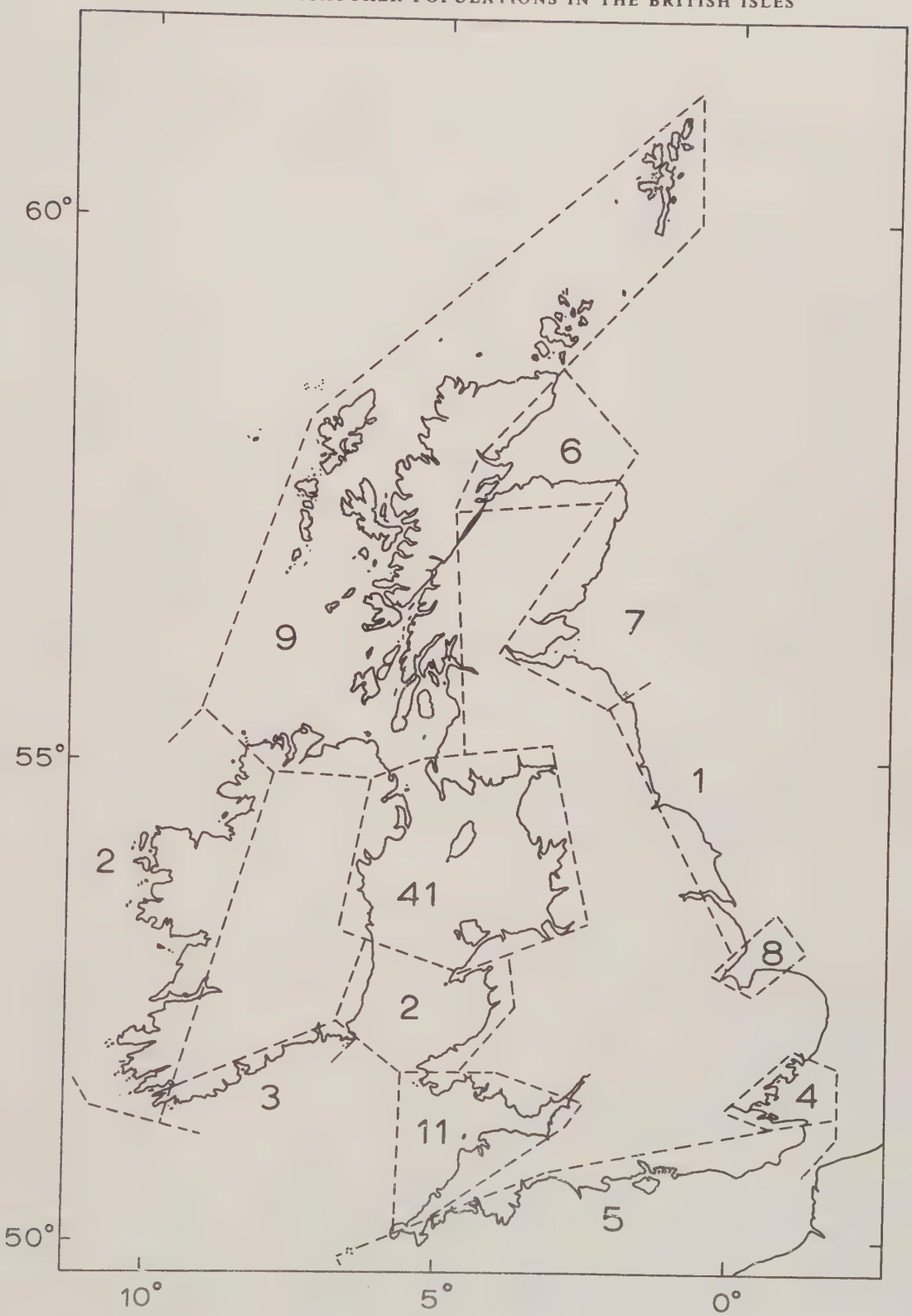

Fig. 3. *The regional distribution of wintering Oystercatchers in the British Isles*, 1963–65. *Regional populations are expressed as percentages of the national population in December and January.*

Table 7. *The regional distribution of wintering Oystercatchers in the British Isles*, 1963–65

Regions	Usual population limits Minimum	Maximum	Approximate median population level	% of total
BRITISH ISLES	95 000	175 000	135 000	
1. N. IRISH SEA (S.W. Scotland, N.E. Ireland, N.W. England and N. Wales)	41 000	70 000	55 500	41
2. S. IRISH SEA (Cardigan Bay and S.E. Ireland)	2 000	4 000	3 000	2
3. BRISTOL CHANNEL (S. Wales, Somerset, N. Devon and N. Cornwall)	10 700	19 700	15 200	11
4. ENGLISH CHANNEL (Scilly Isles to S.E. Kent)	4 700	9 100	6 900	5
5. THAMES (N. Kent and Essex)	4 600	6 400	5 500	4
6. WASH (N. Norfolk and S. Lincs.)	6 500	14 000	10 250	8
7. N.E. ENGLAND (N. Lincs to Border)	1 100	2 500	1 800	1
8. E. SCOTLAND (Border to Fraserburgh)	6 600	13 000	9 800	7
9. N.E. SCOTLAND (Fraserburgh to Duncansby Head, Caithness)	6 000	10 000	8 000	6
10. N.W. BRITAIN (N. and W. Scotland with the Isles, N. Ireland)	8 500	17 000	12 750	9
11. W. IRELAND (N.W. Donegal to S.W. Cork)	2 000	4 000	3 000	2
12. S. IRELAND (S.W. Cork to S.E. Wexford)	2 000	5 000	3 500	3

Note: (i) Proportions in last column are to nearest 1%.
(ii) Data obtained from Appendix III.

HABITATS AND FOODS

Although in autumn and winter Oystercatchers are virtually ubiquitous around our coasts they are most numerous on the sandy and muddy shores of sheltered bays, estuaries and firths, and scarcest on very stony, rocky and precipitous shores. Locally, numbers may habitually forage inland for food in low-lying coastal areas. The range of preys taken consequently varies considerably according to the habitat. Unfortunately, however, with but a few exceptions the food habits of Oystercatchers in the different habitats are very imperfectly known.

It is nevertheless clear from the literature (e.g. Witherby et al. 1940, Drinnan 1957 and 1958, Hancock 1961), and from extensive personal observations, that the staple winter diet of the great majority of Oystercatchers on British shores comprises but three species of bivalve molluscs — *Mytilus edulis* (edible mussel), *Cardium edule* (edible cockle), and the smaller *Macoma balthica*. Where, as is usual, the last two species occur together the cockle is everywhere the preferred prey and *Macoma* is taken persistently in large quantities only when cockles are scarce. In Morecambe Bay, Lancashire, many Oystercatchers resorted to this alternative and abundant food resource when the intertidal cockle stocks were destroyed by the severe cold of the 1962-63 winter (pers. obs.). Similar behaviour was also recorded at this time in the Dutch Waddenzee (Hulscher 1964*b*). In certain areas, notably the Burry Estuary (South Wales), the Wash, and Morecambe Bay, very large wintering flocks of Oystercatchers exploit commercially important

Table 8. *The relative abundance and the foods of wintering Oystercatchers in the British Isles in relation to habitat*

HABITAT				OYSTERCATCHER NUMBERS		PRINCIPAL FOODS EATEN (indicated by *)							
Type	Substratum	Shore width	Examples	Relative abundance	Maximum flock size	cockles	*Macoma*	mussels	other species of lamellibranchs	limpets	periwinkles	polychaete worms	earthworms
I. LITTORAL: SHELTERED													
A. Bays, firths, larger estuaries and natural 'harbours'	firm; sand and mud admixtures	wide or very wide	Morecambe Bay; Solway Firth; The Wash; Dee, Burry, Exe and Swale Estuaries; Brancaster Harbour	numerous; flocks often large or extremely large	12 000	*	*	*					
B. Small estuaries, creeks and 'harbours'	soft; mud and ooze	generally wide	Estuaries of Essex, Suffolk, S. Cornwall and S. Devon; Milford Haven	small numbers; flocks very small or small	500				*			*	
C. Sea-lochs	gravel; or mud or rock	narrow	West coast of Scotland	very few; flocks very small	100			*	*	*	*		
II. LITTORAL: EXPOSED													
A. Beaches	(i) firm; sand	narrow to wide	Bays in Pembroke and N. Cornwall; Aberdeenshire	scarce; flocks very small or absent	50							*	
	(ii) hard; shingle	narrow	E. Devon, W. Dorset, Sussex, Suffolk, S. Norfolk	rare and transient; or absent	—								
B. Rugged	(i) low reefs	narrow to wide	Cardigan coast; S. Devon; Northumberland	few; flocks very small	200					*	*		
	(ii) steep rock or cliffs	very narrow or nil	Many western coasts, Yorkshire and E. Kent	rare and transient; or absent	—					*	*		
III. TERRESTRIAL: SHELTERED													
Coastal fields	firm or soft; earth	—	N. Wales, Cheshire and N.W. England	small numbers; flocks very small or small	500								*

stocks of both cockles and mussels. On the north Norfolk coast small flocks may feed on cultivated mussel beds ("lays") in the harbours at Brancaster and Blakeney. The extent of Oystercatcher damage to cockle stocks in these areas has been assessed by Drinnan (1957), Hancock (1961), and Hancock and Urquhart (1965).

Locally, polychaete worms (such as *Nereis diversicolor*), earthworms, limpets and periwinkles may be important foods for small flocks of Oystercatchers. Elsewhere other molluscs, as well as perhaps several small species of crustacea, may figure in the diet although the relative importance of such preys is little understood. The recorded preys of Oystercatchers in the British Isles are listed in Appendix I.

The general relations between Oystercatcher abundance and foods and the type of habitat are indicated in Table 8. This summarizes the major factors influencing the winter distribution and is necessarily of an imprecise and subjective nature, as no quantitative study has yet been made of these aspects of Oystercatcher ecology. For this reason, only a broad classification of habitat types is attempted and the fine intergradations which occur in habitats and food habits are omitted.

The wintering distribution pattern is basically a reflection of the high food intake requirements of this species. Drinnan (1958*b*) estimated that an Oystercatcher eats nearly one-fifth (17·5%) of its body weight in dry weight of shellfish foods per day — an amount equivalent to several hundreds of live medium-sized mussels or cockles. With such high food demands Oystercatchers can winter in large numbers only where there are large resources of a food or foods available, either superficially or buried within easy reach of their 7 to 9 cm-long bills. In the British Isles these requirements are satisfied only by intertidal populations ("beds") of the lamellibranchs *Mytilus edulis*, *Cardium edule* and *Macoma balthica*, all of which typically occur in sufficient abundance in the littoral zone only on sandy-muddy shores protected from strong wave action. Thus, the 35 main centres (Appendix IV) of British wintering Oystercatchers all occur in estuaries, firths, natural "harbours" and the more sheltered large bays. There, wide expanses of sand and mud flats containing abundant stocks of at least one, and often all, of these three preys are exposed during low-tide periods. Many of the minor population centres, holding 100 to 500 Oystercatchers, are in similar habitats. In general, however, these are either (a) small haunts with only very limited areas of suitably rich feeding grounds, such as small mussel beds (e.g. Teign Estuary, Devon, and Ythan Estuary, Aberdeen), or (b) large haunts with poor and diffuse food resources because the substrate is predominantly ooze or soft mud (e.g. Essex and Hampshire estuaries, the Sussex harbours).

Between their population centres Oystercatchers occur in much smaller numbers thinly distributed around the intervening, usually more exposed, stretches of coast. Birds are moderately plentiful, though never numerous, where there are low reefs, as in Cardigan and south Devon. In such situations very small flocks or groups may winter, living primarily on limpets and some periwinkles. On gravelly shores, and on ooze and soft mud, Oystercatchers winter only in very small numbers and are believed to feed mainly upon polychaete worms as, for example, in the creeks and estuaries of south-west Devon and south Cornwall, and in the higher reaches of Scottish firths and sea-lochs. However, the shores which are most devoid of food for Oystercatchers are shingle beaches, surf-pounded sands, and very rugged coasts. These three habitats are virtually barren and consequently birds are very scarce, transient, or even absent altogether in these areas.

In certain localities Oystercatchers may be found foraging in coastal fields daily from late autumn to early spring. As there is evidence that terrestrial feeding out of the breeding season is a recently acquired habit which has not previously been described in any detail, some account of this interesting behaviour is relevant.

Around Morecambe Bay, where wintering Oystercatchers have for some years fed sporadically in fields, terrestrial feeding became very pronounced and widely remarked upon after the intertidal cockle

stocks in the bay were devastated by the severe icy weather of January and February 1963. During the 1963-64 and 1964-65 winters many hundreds of Oystercatchers fed on the land each day from mid-November to early March, ranging up to four miles inland, but always returning to the sands at dusk where, presumably, they reverted to littoral feeding during nocturnal low-tide periods. Field observations and the gut contents of many shot birds which I examined showed that the food taken comprised almost entirely earthworms, with insignificant quantities of noctuid caterpillars and dipterous larvae. Terrestrial feeding continued through periods of dry weather and short spells of hard frost, being halted temporarily only by snow-cover. The inland feeders became remarkably bold and often foraged in unusual situations, e.g. in hedge bottoms, under trees, within a few yards of farmhouses and caravans, among domestic ducks in rearing enclosures, and even on roadside grass verges within six feet of passing traffic. At Barrow-in-Furness some birds fed in a cemetery (H. Tickle, pers. comm.), and at Ulverston one was found dead in a garden. Since the autumn of 1963 regular terrestrial feeding has also been adopted by hundreds of Oystercatchers in the Wirral and around the Dee Estuary, Cheshire (J. C. Gittins, pers. comm.), as well as throughout the coastal plain of North Wales and beside the Solway Firth.

An increasing tendency for Oystercatchers to feed in coastal fields outside the breeding season has recently been commented on in several other areas, e.g. parts of Scotland (Baxter and Rintoul 1953), Co. Dublin (Kennedy et al. 1954), Cumberland (Stokoe 1962), and Somerset (local report, 1960). In Glamorgan a small flock habitually roosts and feeds during high tide on playing fields by the sea-front at Swansea and, on occasion, numbers of birds remain behind to feed throughout the low-tide period as well. In most places, however, inland feeding still appears to be of rare or casual occurrence and confined to isolated individuals or very small parties.

The reasons for this change of behaviour on the part of some Oystercatchers during the last 10 or 20 years are not fully understood. For some years, however, flocks have roosted quite regularly during very high tides in fields and on golf-links immediately behind the shore in certain localities, e.g. the Wirral (R. J. Raines, quoted by Buxton 1962), the Furness district of Lancashire (D. G. Harrison, pers. comm.), Swansea Bay, Glamorgan (M. P. Harris, pers. comm.) and in north Caernarvonshire (pers. obs.). Inland feeding probably began as an extension of this roosting behaviour, especially perhaps during very wet and stormy weather when low-lying fields might have been partially flooded. Under such conditions large quantities of earthworms would usually be forced to the surface and these would provide a new and temporarily plentiful source of food. From picking up surfacing worms to actively probing for them would be but a short step, particularly for those Oystercatchers which were already inland breeders, and any temporary shortage of normal shellfish foods — such as occurred on the sandy shores of north-west England and North Wales following the severe 1962-63 winter — would tend to accelerate the adoption and spread of this feeding habit.

Whether this new behaviour will become firmly established and increase further, or whether terrestrial foods will continue merely to supplement the normal shellfish diet and serve as a valuable emergency food supply, remains to be seen. These recent events do, however, once more demonstrate the versatility of the Oystercatcher. Indeed, the species is now clearly to a large degree independent of the shore for a winter living. This may represent a logical development from the current colonization of new breeding ranges inland. Certainly, the Oystercatcher is potentially as terrestrial a wader as are the Lapwing (*Vanellus vanellus* (Linnaeus)) and the Golden Plover (*Charadrius apricarius* Linnaeus).

MORTALITY FACTORS

Very little is known about mortality among wintering Oystercatchers in this country save that some deaths occur annually from shooting and various accidental causes and also, at irregular intervals, from starvation during severe winters. Predation and disease appear to be unimportant mortality factors,

although no detailed investigations of the incidence of parasites and pathogenic organisms in this species have yet been made. Threlfall (1965), however, attributed the death of one Oystercatcher to a coccidial infection, whilst Macdonald (1965) cited the probable causes of death of four other birds as due variously to pseudotuberculosis, trematodes and tick pyaemia.

Recoveries of ringed Oystercatchers suggest that comparatively few birds die in winter in relation to recorded losses on the breeding grounds (Dare, in prep.). Shooting mortality is largely restricted to Ireland and to Morecambe Bay. In certain parts of the latter area the Oystercatcher is not a protected species and may be shot by Fishery Officers and other authorized persons. Elsewhere, shooting must be a very insignificant mortality factor. Some Oystercatchers also die accidentally, e.g. by striking overhead wires, by entangling in fishing nets and stake-lines, and by being blown against obstacles in stormy weather, but here also the combined mortality from such causes is probably very small.

During very cold winters numbers of Oystercatchers may starve to death as a result of their feeding grounds becoming covered by ice-floes for long periods. Records are very sparse, and no detailed analysis is possible, but it is known that widespread mortalities occurred in Scotland during severe weather early in 1947, 1955 and 1963. In 1963 at least 400 corpses were found in the Solway Firth alone, and in several parts of England and Wales, too, unusual numbers were found dead and in an emaciated condition (Dobinson and Richards 1964). Regional losses appear, however, to have been quite small except in the Dee Estuary where ca. 150 corpses were noted (E. White, pers. comm.) and in the Exe Estuary where at least 80 carcases were found. In the latter area, F. R. Smith (pers. comm.) estimated that the recorded mortality was approximately 8% of the wintering population and that the total mortality for that estuary could have been twice as great. By contrast, where food was still plentiful and accessible mortality was very slight. Thus, in parts of Morecambe Bay no frost mortality was recorded at all and shot birds from these areas were found to be in very good condition and possessing appreciable subcutaneous fat deposits (pers. obs.).

During the 1963–64 winter a marked mortality occurred among Oystercatchers throughout the Lancashire–North Wales area at a time when, as noted earlier, large numbers of birds were feeding on the land. The mortality, which involved scores if not hundreds of birds, occurred primarily in late December and early January, and corresponded with short periods of hard frost when either the soil became too frozen for the birds to probe, or else the earthworms had burrowed deeper beyond the reach of the Oystercatchers' bills. It is a notable fact that whilst Oystercatchers do sometimes undertake hard-weather movements many birds appear to be very slow to do so. Instead, such individuals seem to persist in exploiting a food supply which may no longer have survival value.

What evidence there is would suggest that whilst catastrophic mortalities may occur, due to severe winters, their incidence is too irregular and localized to have any pronounced effect on overall population levels.

RECENT CHANGES AND TRENDS

Very little can be deduced from the literature about any changes in the size or distribution of the wintering population prior to 1945. About the beginning of this century wintering Oystercatchers appear generally to have been less numerous than they are today, but this may be attributed more to a scarcity of observers, coupled with a widespread disinterest in recording the numbers of commoner species, rather than to a shortage of Oystercatchers. This state of affairs lasted, with few exceptions, until 1945. However, since the late 1940s observer coverage has extended rapidly and more attention has lately been devoted to population estimates. Even so, the recording of Oystercatcher flocks remains so incomplete that comparative data, spanning the last 15 or 20 years, are available only for a very few areas.

What information there is indicates that no decreases have been reported anywhere except for some notable falls in north-west England. On the contrary, there have been recently steady increases in wintering

levels among the more closely observed populations in the smaller, but nonetheless important, haunts in southern and eastern England. A similar trend has been suspected in Scotland and might well be proceeding, unrecorded, elsewhere correlated with the current expansion of many northern breeding populations.

British Isles: Increases

Examination of the records in county ornithological reports shows that increases in wintering numbers are undoubtedly occurring in places as far apart as Devon, Kent, Essex, Yorkshire, and Durham. In south Devon, the winter flock on the Exe Estuary has trebled since 1945, rising gradually from 500–1 000 to 2 000–3 000 birds. During the last ten years Oystercatchers have also become noticeably more plentiful and exploratory in the much less suitable estuaries of the Rivers Plym, Tavy and Tamar (pers. obs.). In Kent, Harrison (1953) remarked that a great increase had occurred since ca. 1930 in the numbers of both passage migrants and winter visitors; the population in the Swale Estuary, the main centre in that county, has, however, been fairly stable since ca. 1958 at around 2 000 birds. Observers in Essex have recorded a trebling of the winter flock at Foulness during the last 15 years. Here, numbers have risen sharply from ca. 800 in 1951–52 to 2 000 by 1958 and to ca. 3 000 in the 1964–65 winter. In the Tees Estuary (Yorkshire/Durham border) the Oystercatcher is likewise said to be increasing as a winter visitor, though numbers there are still not large (Stead 1964).

According to Baxter and Rintoul (1953) there has recently been an apparent increase in wintering numbers in many parts of Scotland, but no details are given. Certainly, in both Orkney and Shetland Oystercatchers now winter regularly in small numbers where, in the late 19th century, they were almost rare (Venables and Venables 1955, R. J. Tulloch, pers, comm.).

British Isles: Decreases

Whatever increases have occurred in local wintering populations have been more than offset by a very recent and very large decrease in the numbers wintering in Morecambe Bay. Oystercatchers, seemingly, have always been very numerous in this bay (Macpherson 1892, Oakes 1953, local reports), although no figures are available prior to 1950. During the 1950s an enormous population wintered. In the very cold 1953–54 winter an estimated 120 000 or more Oystercatchers were feeding on the cockle beds alone, in the northern part of the bay, whilst 30 000–37 000 were present again during the following (milder) winter (Drinnan 1957). These estimates did not take into account the large flocks which always feed on mussel scars elsewhere around the bay. The latter birds were, however, included in an estimate of ca. 120 000 made during the 1960–61 winter by P. E. Davidson (pers. comm.).

Since 1961 there has been a rapid fall in Oystercatcher numbers in Morecambe Bay associated with a parallel decline of the previously vast cockle stocks which culminated in the virtual destruction of this food resource by the prolonged severe frosts of the 1962–63 winter. Since early 1963 investigations of the cockle beds have shown that this prey has remained scarce in Morecambe Bay (P. E. Davidson and D. G. Harrison, pers. comm.). Estimates of the Oystercatcher population during recent winters trace the course of the "crash" from the 1960–61 level of ca. 120 000 down to ca. 50 000–60 000 (1961–62), ca. 30 000–40 000 (1962–63), and to ca. 10 000–12 000 (1963–64), followed by a slight recovery to ca. 12 000–15 000 in the winter of 1964–65 (P. E. Davidson; pers. obs.). Thus, in less than three years, Oystercatcher numbers fell by approximately 90%, or ca. 100 000 birds, a population nearly equivalent to the entire wintering population of England, Wales and Scotland in the succeeding winters of 1963–64 and 1964–65.

The origins of the immense numbers of Oystercatchers which wintered in Morecambe Bay in the 1950s, and their subsequent movements, are not known. There is no evidence of a massive mortality anywhere in the British Isles during the period of the "crash". Locally heavy losses did occur, as noted earlier, in certain areas during the severe 1962–63 winter, though not in Morecambe Bay itself. In any case, even

before that winter the population had already fallen by more than 60 000 birds and any mortality in Morecambe Bay did not occur until much later, in fact, during the 1963–64 winter when there were strong indications that a food shortage had ensued following the devastation of the cockle stocks.

If the decrease cannot be accounted for by mortality then it must be assumed that ca. 100 000 Oystercatchers were displaced from Morecambe Bay between early 1961 and autumn 1963, to re-distribute themselves either around our own coasts or on Continental shores. Whilst some birds must undoubtedly have been absorbed into other British population centres no sudden influxes of the required magnitude were observed, and that this must be so is apparent from consideration of the present overall level of population. The great majority of displaced Oystercatchers would thus appear to have emigrated and remained abroad in subsequent winters. The nearest and most likely alternative wintering ground which is known to be the resort of comparable numbers of Oystercatchers is the vast area of the Dutch Waddenzee, 350 miles E.S.E. of Morecambe Bay and no further away than south-west Ireland. Drs. J. B. Hulscher informs me that a total of 163 000 Oystercatchers was counted on 22/23 August 1962, during a census of the entire Dutch Waddenzee area by a large team of observers. Furthermore, wintering numbers in this haunt are even higher than during August. Some slight evidence of interchanges with the Dutch wintering flocks is afforded by an Oystercatcher which was caught and ringed (Leiden 400.8274) in Zeeland on autumn passage in October 1960, and subsequently shot in Morecambe Bay the following autumn, in November 1961. The coasts of north-west France, which form another major wintering area, are rather more distant, lying between 370 and 600 miles to the south.

The wintering population of the Dee Estuary, Cheshire, has also decreased markedly in recent years. During the years 1958-63, for which the most reliable figures are available, between 5 000 and 10 000 Oystercatchers regularly wintered there, and there is a suggestion that numbers may have been considerably higher during the 1950s when the Morecambe Bay population was at its peak. Published estimates of flocks of ca. 50 000 on 14 November 1954 (Merseyside Nat. Assoc. Rep. 1955) and of nearly 100 000 on 19 January 1952 (Ellison and Craggs 1955), even should they be excessive, do indicate that very large flocks indeed must have occurred about this time. In recent winters (1963-64 and 1964-65) no more than 3 000-5 000 Oystercatchers have stayed in the whole Dee area (J. C. Gittins, pers. comm.) where, too, intertidal cockle stocks have declined in the last 10 years.

The overall impression obtained from the recent changes in our wintering population is that the large decreases in the Morecambe Bay flocks, with which may be associated similar reductions in the Dee Estuary, have proceeded independently of an opposing general trend. In this respect the events in Morecambe Bay may be regarded almost as having been superimposed upon the national pattern and, especially in view of their magnitude, it is all the more unfortunate that the earlier history of this population is unknown.

Other Countries

Information is lacking on any changes in Oystercatcher numbers in other major European wintering grounds. In Iceland, however, where, as a result of recent climatic amelioration, increasing numbers of some waders and other species winter (Gudmundsson 1951), it is probable that more Oystercatchers now remain in that country instead of migrating southwards to British winter quarters.

THE SUMMERING (NON-BREEDING) POPULATION

From autumn to early spring adult and immature Oystercatchers occur together and mix freely in the flocks on our shores. Examination of more than 5 000 Oystercatchers trapped or collected between August and March in Wales and Morecambe Bay has shown that these flocks are normally composed of 70-80% adult birds and 20-30% immatures (Dare, in prep.). Upon the spring return of adults to their breeding

grounds, however, the immatures together with small numbers of non-breeding adults are left behind in residual flocks which summer in the winter quarters. For present purposes this non-breeding population is considered to comprise all flocks which remain with us between the ending of the lengthy northerly spring migration and the onset of the post-breeding dispersal and return southerly autumn migration. In fact, there is only a brief period of some seven weeks, from mid-May to early or mid-July (Witherby et al. 1940), when long-distance movements have virtually ceased. This section brings together what little information we have on the distribution, composition, and the size of the summering population.

As the major part of this population is composed of immature birds a preliminary consideration of this phase of the Oystercatcher's life will be appropriate. Dircksen (1932) speculated that the Oystercatcher does not attain sexual maturity until its third year and thus breeds for the first time when nearly three years old — confirmed in one instance by Jungfer (1954). However, recent evidence suggests that some birds may not begin breeding for another year. From his close study, by ringing and colour-banding, of the breeding population on Skokholm, M. P. Harris (pers. comm.) believes that first breeding may be delayed in some individuals until their fourth year. Support for this view is provided by field observations of some summering Oystercatchers which were trapped, colour-banded and released in the Dee Estuary, North Wales, on 26 June 1963, by E. White and J. C. Gittins. On that date, 138 non-breeders were marked with a specific colour code; 125 of these were observed by the writer to be in the distinctive drab immature plumages, some of which are described in Witherby et al. (1940). No birds-of-the-year were trapped and so the youngest immatures must have been reared the previous year (1962) and were therefore approximately one year old at the time of marking. In May and June 1965 two of these Oystercatchers were seen summering in Conway Bay, some 30 miles west of their place of ringing. Both were still obviously in immature plumage even though in at least their third year, and clearly neither would be breeding until a later year.

DISTRIBUTION

Information is too sparse to plot in detail the distribution of these summering flocks but, in general, this does not appear to differ significantly from the wintering distribution (Fig. 2). The diet, too, is essentially the same as in winter although small numbers of shrimps and shore-crabs may now be taken in some localities, such as Morecambe Bay (ref. Appendix I). Mortality during this time of easy living can be expected to be lower than in any other period of the Oystercatcher's life.

COMPOSITION

The great majority of summering Oystercatchers are immature birds. This is readily apparent from observations of the flocks and, although no precise counts have been made, at least 75-90% of the non-breeders will be found to be in immature plumages. Of 138 birds trapped from such a flock in the Dee Estuary, North Wales, on 26 June 1963, 91% were undoubted immatures. The remainder were apparently adults in breeding plumage although some of these individuals lacked the lustre and brilliance of the full breeding dress, as if they had only recently completed the moult from the immature condition. Alternatively, these birds could have been adults which, for some reason unknown, were making no attempt to breed that year. Interrupted breeding has recently been suspected among nesting populations on Skokholm (M. P. Harris, pers. comm.) and in Germany (Jungfer 1954). Presumably, many non-breeding adults would tend to remain in the flock rather than return to their breeding areas.

The rarity of immature Oystercatchers, other than chicks and fledglings, on the breeding grounds further supports the view that this age group remains in the wintering haunts during the breeding season. In surveys of inland breeding populations in northern England and Scotland in June and early July 1963-65 only one immature was located among 2 300 birds scrutinized. It was with a post-breeding flock of adults on a river bank 15 miles from the sea. In the Faeroe Islands, during May and June 1965, two imma-

Table 9. *Comparison of the numbers of Oystercatchers wintering and summering in certain haunts*

	WINTER			SUMMER			
	Usual population limits		Approx. median pop. level (Column A)	Usual population limits		Approx. median pop. level (Column B)	B/A (%)
	Minimum	Maximum		Minimum	Maximum		
Morecambe Bay	12 000	15 000	13 500	2 000	4 000	3 000	22
Burry Estuary area	9 000	16 000	12 500	1 000	3 000	2 000	16
The Wash	5 500	11 500	8 000	500	1 000	750	9
Dee Estuary	3 000	5 000	4 000	500	1 000	750	19
Conway Bay	2 500	3 500	3 000	1 000	1 500	1 250	42
Swale Estuary	2 000	2 500	2 250	200	500	350	16
Exe Estuary	1 500	2 500	2 000	600	1 100	850	42
			45 250			8 950	20

Note: (i) Figures for Morecambe Bay, Burry Estuary and Conway Bay are based on our own M.A.F.F. surveys; all others are derived from county reports.
(ii) Proportions in last column are to nearest 1%.

tures were noted in a sample of ca. 1 960 birds observed, and both were in communal feeding and bathing areas. Likewise, on Skomer and Skokholm immature Oystercatchers are rarely seen in the breeding areas on the tops of these islands. They are instead usually confined to the communal feeding and assembly places on the sea rocks. On Anglesey a similar segregation is found.

POPULATION ESTIMATE

Published data on non-breeding flocks are so few that an estimate of the overall size of the summering population can be given only in comparative terms. Many non-breeders are said to remain the summer in Ireland (Kennedy et al. 1954), and in Ulster flocks of up to 70 occur at this season (Deane 1954). Similar comments abound in the literature for England and Scotland.

For several of the main haunts, where counts of summering flocks have occasionally been made by local observers and ourselves, some indication of the relative levels of wintering and summering populations is obtainable (Table 9). However, summering numbers may locally be subject to considerable and seemingly erratic annual fluctuations. These might be due to various factors, e.g. annual variations in breeding success, irregular local flock movements, or to spring influxes of immature birds from more southerly winter quarters in western France and Iberia. Unfortunately, the migrations of immature Oystercatchers at this season are obscure.

The data in Table 9 would suggest that in important haunts the summering population may be as high as 40% of the winter level, although 10-20% is probably more usual. In some of the minor haunts — those supporting less than 250 birds — summering numbers may exceed the wintering numbers. Overall, however, the size of the summering population is probably about a fifth of that of the wintering population.

DISCUSSION

The European Oystercatcher is clearly a very successful species by virtue of its vast breeding range and general abundance — features shared by several of its congeners in other parts of the world. It seems appropriate, therefore, to conclude by noting likely reasons for this success and by considering what changes may be expected in the British populations in the foreseeable future.

The Oystercatcher's success is probably largely due to the fact that whilst it is specialized to feed on an abundant food resource — marine bivalve and gastropod molluscs — which is virtually unexploited by any other bird, it has nevertheless remained sufficiently unspecialized to utilize effectively an impressively wide range of other invertebrate preys. Thus, the bill, which is primarily adapted for just such a molluscan diet, also functions as an admirable tool for capturing and disabling crabs and other subsidiary preys, from annelids to insects. Such versatility enables Oystercatcher populations to breed in many contrasting habitats, in most of which several different food resources can be utilized. More or less unspecialized nest-site requirements also facilitate the occupation of a wide habitat range. In the winter quarters the ability to turn to other preys has obvious survival value should the normal bivalve foods become scarce as did, for example, cockles and *Macoma* in some areas after the severe 1962-63 winter.

One striking consequence of this adaptability is being witnessed at the present time in northern Britain and other countries bordering the North Sea where Oystercatchers are spreading rapidly inland. This expansion of breeding range may be regarded as the result of a major break-through from the shore on to the land. It is not entirely without precedent, however, for in the eastern highlands of Scotland inland breeding has been established for at least 200 years, whilst in southern Russia it is probably of much more ancient origin. Nevertheless, it is perhaps most significant that recent changes have all begun only since the late 19th century, and have become most pronounced since ca. 1920, concurrent with parallel trends in some northern coastal breeding strongholds such as Scotland and Iceland.

Various factors have favoured a general population increase, notably the climatic amelioration in Iceland, the human de-population trend in the Scottish isles, and the greater protection from human predation afforded this species virtually everywhere. All of these factors have become increasingly effective in the last few decades. On the other hand, Oystercatchers have increased in the face of large increases in the populations of their main avian predators, crows and gulls. At the same time mammalian predators have not declined markedly overall, whilst general habitat disturbance from agricultural operations and urbanization has intensified in many areas.

The Oystercatcher is inherently a bold, aggressive and adaptable species which responds quickly to protection. It appears to have found a vacant ecological niche on land, which it is now successfully exploiting. If present trends continue the greater part of the British Isles, and perhaps also much of north-western Europe, may eventually be colonized by inland breeders.

The further expansion of breeding populations will inevitably result in larger wintering populations. Indeed, in parts of the British Isles there is reason to believe that such a trend has already been under way for several decades. However, wintering population levels will presumably always be subject to annual and local fluctuations, especially in those major haunts where very large concentrations of Oystercatchers are more or less dependent upon just one prey species. Wherever that staple food is the cockle particularly large variations in bird numbers are to be expected, correlated with the periods of extreme abundance and scarcity frequently exhibited by cockle stocks. The availability of alternative foods and their utilization by Oystercatchers have not yet been fully investigated, and it remains to be seen whether the recently acquired winter terrestrial feeding habit is extended further.

SUMMARY

1. The numbers, distribution, habitats, foods, mortality factors, and recent trends in the populations of Oystercatchers breeding and wintering in the British Isles have been assessed on the basis of information obtained from the literature, local observers, and special surveys.

2. At least 19 000 pairs — and possibly 30 000 to 40 000 pairs — breed in the British Isles. Nearly three-quarters of these nest in Scotland, only about 10% in England and Wales, and the remainder in Ireland. Oystercatchers occupy a very wide range of coastal habitats and also breed inland over much of Scotland and northern England.

3. As a result of increasing protection and changing habits the British breeding population is currently in a phase of expansion in northern areas. In many southern areas, however, coastal breeding ranges are contracting into nature reserves and on to islands, due to increasing habitat disturbance and destruction.

4. Coastal-breeding birds feed mainly on bivalve and gastropod molluscs and on polychaete worms although the diet may locally be very varied. Inland nesters feed primarily on earthworms, insects, and other soil invertebrates.

5. The wintering population of the British Isles during the 1963-64 and 1964-65 winters was estimated at between 95 000 and 175 000 birds.

6. The bulk of wintering Oystercatchers is confined to 35 main haunts of which the Solway Firth, Morecambe Bay, the Burry Inlet and The Wash comprise the four most important. Approximately 40% of the birds winter around the northern shores of the Irish Sea; they are scarcest in north and west Scotland, western Ireland, north-east England, and along the English Channel coast.

7. The staple foods of most wintering birds are the three bivalves *Cardium edule*, *Macoma balthica* and *Mytilus edulis*, but small numbers subsist locally on limpets, periwinkles and polychaete worms. The relations between the wintering distribution and prey availability are outlined and discussed.

8. The recently acquired terrestrial feeding habit of some wintering birds is described and its significance discussed.

9. There is a trend towards increasing wintering numbers in many southern haunts, although nationally this has been outweighed by a recent decline in the previously enormous flocks which wintered, until 1961, in the Morecambe Bay and Dee Estuary areas of north-west England. It is suggested that most displaced birds probably moved abroad to the alternative major wintering grounds on the coasts of Holland and France.

10. A residual population of non-breeding birds, mostly immatures, summers in the coastal wintering haunts. The size of this summering population may approximate to one-fifth of the wintering population level.

11. It is concluded that the Oystercatcher, although a specialized marine mollusc predator, is nevertheless an adaptable species which has recently begun to exploit a vacant ecological niche on the land. Some possible consequences of this radical change in breeding habits are considered.

ACKNOWLEDGEMENTS

This work was carried out under the auspices of the Fisheries Division of the Ministry of Agriculture, Fisheries and Food during the tenure of a Civil Service Commission Research Fellowship. I am very grateful to Dr. H. A. Cole, Director of Fisheries Research, for advice and guidance throughout the work, and to the staff of the Fisheries Experiment Station at Conway for facilities and help in many ways. I am also indebted to the British Trust for Ornithology for access to data on the nest records, ringing recoveries, and inland breeding of Oystercatchers; to E. J. M. Buxton for assistance with inland breeding populations; to the Nature Conservancy for permission to work in their reserves at Forvie and Newborough Warren; to the Nature Conservancy and West Wales Naturalist Trust for allowing me to work on Skomer Island; and to D. R. Saunders, Warden of Skomer, for his help and hospitality. Finally, I am especially grateful to the many observers, whose names appear throughout the text, who willingly supplied valuable information on their local Oystercatcher populations.

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APPENDIX I: RECORDED FOODS OF OYSTERCATCHERS IN NORTH-WEST EUROPE

THE following is a list of animals recorded as having been eaten by Oystercatchers in north-west Europe. The list is not exhaustive, since it could be extended much further by detailed food-habits studies in a greater variety of habitats. Nevertheless, all the principal prey groups are included. Their relative importance in the diet is noted, so far as this can be inferred, from the sparse literature, from personal field observations, and from 967 samples of autumn and winter stomach contents obtained in Lancashire and Wales and analysed by the writer.

MOLLUSCA: LAMELLIBRANCHIATA

Mytilus edulis L. *Cardium edule* L. *Macoma balthica* (L.)	the three main foods of non-breeding Oystercatchers; also important locally to many breeding populations.
Tellina sp.	England, Morecambe Bay, recorded by Drinnan (1957).
Mya arenaria L.	Holland, many eaten locally (Hulscher 1964*b*); England, Morecambe Bay, only three records in 629 stomach contents analysed (present study).
Scrobicularia plana (da Costa)	England, Esk Estuary, many breeding season records (M. Norton-Griffiths, pers. comm.); Wales, Burry Estuary, a few records (P. E. Davidson, pers. comm.); Holland, a few records (Hulscher 1964*b*).
Modiolus modiolus (L.)	Scotland, recorded by Dewar (1913), as *Modiola modiolus*.
Venerupis pullastra (Montagu)	Scotland, recorded by Dewar (1913), as *Tapes pullastra*.
Pholas crispata Linnaeus	Scotland, recorded by Dewar (1913).
Ostrea edulis L.	Considered by Dewar (1922) to have been the former principal food before its virtual disappearance from the littoral zone; no modern records as prey except Menai Straits, Wales. (H. A. Cole, pers. comm.).

MOLLUSCA: GASTROPODA

Patella spp.	The main food of breeding populations on rocky coasts; at other seasons far less important although still widely taken.
Acmaea testudinalis Müller	Scotland, recorded once by Dewar (1913).
Littorina spp.	An occasional food of normally little importance; but nearly 200 opercula in the stomach of a bird from Wales (present study); recorded in Norway (Collett 1872).

Nucella lapillus (L.)	Scotland, a few records by Dewar (1910, 1913), as *Purpura lapillus;* Ireland remains of ca. 40 in one stomach (Dresser 1871-1881). Iceland, an important food (F. Gudmundsson, pers. comm.).
Buccinum undatum L.	Ireland, recorded once by Dresser (1871-1881).
CRUSTACEA: DECAPODA	
Carcinus maenas (L.)	Locally important food of breeding birds in Holland (Hulscher 1964*a*) and recorded also in England (Tinbergen and Norton-Griffiths 1964); some eaten by autumn flocks in Morecambe Bay (present study); crabs (species?) also taken commonly in Denmark (Helms 1944).
Portunus spp.	Recorded in Witherby et al. (1940).
Crangon crangon (L.)	England, very small numbers taken by autumn flocks in Morecambe Bay (present study); shrimps also recorded by Witherby et al. (1940).
CRUSTACEA: AMPHIPODA	
Corophium volutator Pallas	Holland, recorded by Hulscher and Hulscher-Emeis (in prep.); England, amphipod remains (species?) only twice noted in 629 stomach analyses of birds from Morecambe Bay (present study).
Talitrus saltator (Montagu)	England, taken by some breeding birds at Ravenglass — mainly to feed small chicks (M. Norton-Griffiths, pers. comm.).
ANNELIDA: POLYCHAETA	
Arenicola marina L.	Occasional food, more especially of some breeding populations; Scotland (present study); Holland, recorded by Hulscher (1964*c*); also noted in Witherby et al. (1940).
Nereis diversicolor O. F. Müller	Holland, many eaten (Hulscher 1964*c*).
Nerine cirratulus (Delle Chiaje)	Holland, frequent prey (Hulscher 1964*c*).
	Note: Polychaetes often eaten in certain areas by small numbers of birds, and fed to broods, in British Isles (present study); species not identified in field. Iceland, important preys (F. Gudmundsson, pers. comm.).

ANNELIDA: OLIGOCHAETA	
Lumbricidae	Earthworms form staple food of inland breeding populations in British Isles, and are taken locally by some winter flocks in large quantities, e.g. Lancashire and N. Wales (present study).
	Note: "worms" are among the more important foods in Scandinavia (Helms 1944, Svärdson 1950).
ECHINODERMATA: HOLOTHURIA	exceptional; recorded by Witherby et al. (1940). Ireland, one record of *Cucumaria* sp. in a stomach (Dresser 1871-1881).
INSECTA	
(Very little information available).	
LEPIDOPTERA (larvae)	Probably the most important of the insect foods to inland breeders; very occasionally taken at other times; chiefly Noctuidae (present study, Witherby et al. 1940); Norway, larvae and pupae recorded by Collett (1872).
COLEOPTERA	Unimportant except to some inland and sand dune breeders; very rare in stomachs of winter birds feeding in coastal fields (present study); noted in Witherby et al. (1940); M. Norton-Griffiths (pers. comm.).
DIPTERA	Unimportant except to some inland and sand dune breeders; chiefly Tipulidae and larvae (Witherby et al. 1940); occasionally imagines of *Calliphora* and *Lucilia* spp., (M. Norton-Griffiths, pers. comm.); rare in stomachs of winter birds feeding in coastal fields — larvae of Calypterae recorded (present study).
DERMAPTERA	Exceptional; England and Wales, two records of *Forficula* sp. in stomachs of autumn and winter birds feeding in coastal fields (present study).
PISCES	
Ammodytidae	England, sand-eels were taken in some numbers by a breeding pair at Ravenglass in 1965 (M. Norton-Griffiths, pers. comm.).
AVES	
Laridae	British Isles, exceptionally predation on eggs of terns (*Sterna* spp.) by breeding Oystercatchers; recorded in Shetland (Jamieson 1925) and Norfolk (R. Chestney, pers. comm.); noted in Witherby et al. (1940); see also p. 9.

APPENDIX II: DISTRIBUTION OF THE BRITISH BREEDING POPULATION OF OYSTERCATCHERS, 1960–65

COUNTY AND REGIONAL DATA

SECTION A, ENGLAND AND WALES (COASTAL)

For each coastal county the relevant data on which the population estimates have been based are presented in the following order:

(i) the probable overall limits of the breeding population (in pairs) during the period 1960-65;
(ii) the usual population limits for the principal breeding areas, together with a brief outline of the status elsewhere in the county;
(iii) habitat notes;
(iv) sources of information, e.g. annual reports of county ornithological societies, local observers (pers. comms.), surveys (='M.A.F.F. surveys') made by the writer and his colleagues.

CORNWALL

150-250 pairs
Scilly Isles, 100-150; Mainland north coast, 40-80 (breeds scattered Godrevy Pt. to Hartland Pt., averaging ca. a pair per 1 or 2 miles of coast); mainland south coast, 10-25 (very scattered — ca. 3 pairs breed Cudden Pt., 1 pair bred St. Austell Bay 1961, and has bred Lantivet Bay 1952); Land's End Peninsula, no known breeding records but possibly a few breed undetected. (Observer coverage generally sparse on mainland).
Habitats: typically high cliffs, sometimes precipitous, on mainland: low rocky coasts with sandy and shingle beaches in Scilly Isles.
Authorities: Ryves (1948), R. Khan, F. R. Smith, J. L. F. Parslow, C. J. Stevens, and J. E. Beckerlegge.

DEVON

25-50 pairs
Lundy, 10-20; north coast, 10-20 (mainly Hartland Pt. area, but a pair bred Braunton Burrows 1960 and Bull Point 1963); south coast, 5-10 (very scattered — Start Point annually and probably also near Berry Head, 1 pair bred Budleigh Salterton 1962, and has bred Scabbacombe 1950 and formerly Beer Head 1927).
Habitats: essentially high cliffs; rarely on beaches.
Authorities: county reports, F. R. Smith, personal observations.

SOMERSET

5-10 pairs
Around Bridgewater Bay, principally Steart Island, occasionally at Berrow (a pair 1959 and 1964); a pair bred Sand Point 1962 and on Flatholm 1959.
Habitats: principally sandy and pebbly beaches.
Authorities: county reports.

GLOUCESTER

0 pairs
Has never been known to breed.
Authorities: county reports.

DORSET

5-15 pairs
Apparently confined to Poole Harbour where 11 pairs bred on Brownsea Island in 1963; no breeding records from west Dorset.
Habitats: mainly sandy and shingly beaches in natural 'harbour'.
Authorities: county reports.

HAMPSHIRE

20-30 pairs
Primarily western Solent between Beaulieu Estuary and Keyhaven on the mainland (10-15 pairs) and around estuary of Newtown River, Isle of Wight (up to 15 pairs); rare elsewhere but one pair occasionally in Christchurch Harbour (e.g. 1956 and 1962) and bred nearby on top of Hengistbury Head in 1944.
Habitats: saltmarshes and adjoining shell and shingle shores.
Authorities Cohen (1963), county reports.

SUSSEX

5-10 pairs
Mainly east Sussex; Rye Harbour-Midrips area, 4-7; Chichester Harbour, up to 5; Pagham Harbour, 1 or 2 almost annually.
Habitats: shingle shores mainly; has bred in a flax field near Rye in 1951.
Authorities: county reports, M. Shrubb.

KENT

60-70 pairs
Essentially Medway Estuary and adjacent areas of The Swale and Isle of Grain (63 pairs in 1961); otherwise only at Dungeness regularly (1 or 2) and occasional pair at Sandwich Bay; has exceptionally bred Isle of Thanet 1946 and 1949 between Reculver and Birchington.
Habitats: mainly saltmarshes and estuarine islands where nests also found on sea-walls, derelict barge, wooden float, and tops of eroded timber piles standing in tideway; on shingle in south-west Kent.
Authorities: county reports.

ESSEX

20-30 pairs
Mainly estuaries of R. Blackwater, R. Crouch and Hamford Water; also breeds up to eight miles up estuaries of R. Colne and R. Stour.
Habitats: saltmarshes and estuarine islands.
Authorities: county reports, J. Weston.

SUFFOLK

50-60 pairs
Scattered from Benacre to R. Deben; Orfordness Nature Reserve (ca. 16 pairs) has the only concentration of any note; isolated pairs up estuaries of R. Deben and R. Orwell to four miles from mouths; breeds along estuaries of R. Butley, R. Alde, and R. Blyth up to Blythburgh.
Habitats: estuarine and shingle ridges mainly; also nests on arable land at Minsmere and between Benacre and Dunwich; on edge of heathland between Benacre and Dunwich; on old river walls beside Blyth Estuary.
Authorities: G. B. G. Benson, H. E. Axell, D. White, R. Partridge, C. Curtis.

NORFOLK

200-250 pairs
Scolt Head nature reserve, 110-115; Blakeney Point nature reserve, 40-60; elsewhere along north coast, from Cley to Holme, 40-60; The Wash, from Snettisham to Terrington, 15-30; possibly a few nest along the remaining coast from Weybourne to Great Yarmouth; in south Norfolk only breeds inland in Breydon Water-Runham area, up to eight miles from coast (2-5 pairs annually); has bred recently near Horsey Mere (1 to 3 pairs, 1950-57) and very probably at Cantley Reservoir, R. Yare (2 pairs summered 1956).
Habitats: mainly shingle beaches and sand dune areas; saltmarshes; grazing marshes; very scattered pairs in coastal arable fields up to one mile inland around Cley, Thornham and Wolferton, and at Runham.
Authorities: county reports, R. Chestney, E. Eales, Richardson (1962).

LINCOLNSHIRE

15-25 pairs
The Wash, from Gibraltar Point to Terrington, especially Holbeach area; N. Lincs., between Saltfleet and Tetney (up to five pairs); apparently not on open coast between Saltfleet and Gibraltar Point; has bred ca. 16 miles up Humber Estuary 1953-54.
Habitats: reclaimed land (Wash); arable fields up to two miles inland in N. Lincs.
Authorities: Smith and Cornwallis (1955), county reports.

YORKSHIRE

1-3 pairs
Humber Estuary: Spurn Head, 1-2 annually; Sunk Island, a pair bred 1961 eight miles up the estuary. A pair bred at Teesport in 1962.
(Inland breeding — see Section B).
Habitats: shore, coastal fields.
Authorities: county reports.

DURHAM

0-1 pairs
Possibly breeds Tees Estuary where intermittent breeding by one or two pairs was recorded from 1933 to 1959 near Greatham Creek.
(Inland breeding — see Section B).
Habitats: probably saltmarsh.
Authorities: county reports, Stead (1964).

NORTHUMBERLAND

50-70 pairs
Farne Islands, 30-40; mainland, 20-30 well scattered.
(Inland breeding — see Section B).
Habitats: mainly low rocky islets; otherwise low rocky shores and beaches on mainland; has bred in arable fields half mile inland near Bamburgh in 1954.
Authorities: county reports, P. R. Evans.

CUMBERLAND

350-450 pairs
Solway Firth, Rockcliffe to Grune Point, 100-150; Duddon Estuary, 50-70; Esk Estuary and Ravenglass areas, 85-105; elsewhere, common along open coasts (1-5 pairs per mile) except between Workington and Whitehaven where may not breed.
(Inland breeding — see Section B).
Habitats: mainly saltmarshes, sand dunes and open shingly beaches; regularly in arable fields to quarter mile inland in Ravenglass area; one pair nested on the mainline railway track near Ravenglass in 1964.
Authorities: R. Stokoe, A. B. Warburton.

LANCASHIRE

125-190 pairs
Morecambe Bay, Walney Is. to Wyre Estuary, 110-150 (50-60 on Walney Is.); Ribble Estuary, 5-10; Freshfield-Ainsdale dunes, 10-25; 0-5 very scattered inland, between Southport and Salford, up to 10 miles from tidal waters (e.g. bred Lydiate 1962, Culcheth and Burtonwood 1963; between 1947 and 1959 breeding also noted at Ince, Altcar, Lathom, Little Crosby-Hightown, Astley Flash, Thelwall Eye, and Hale Marsh beside Mersey Estuary). Details of true inland breeding in north Lancashire are given in Section B.
Habitats: mainly saltmarshes, shingle beaches and sand dunes; in S. Lancs. on coastal arable land, mossland, 'flashes', old aerodrome, and slag heap; also on slag banks and railway embankments on Morecambe Bay saltings.
Authorities: Buxton (1962), D. G. Harrison, H. Tickle, M. W. Greenhalgh, county reports and M.A.F.F. surveys.
N.B. The small coastal area of Westmorland around the Kent Estuary is here incorporated with Morecambe Bay.

CHESHIRE

5-15 pairs
Dee Estuary, Burton marshes (5-10); Mersey Estuary, between Ellesmere Port and Runcorn (1-5); none elsewhere.
Habitats: saltmarshes and fresh marshes behind sea-wall or canal banks; has bred (1940) on cobbled wall of Manchester Ship Canal near Runcorn; occasionally arable land.
Authorities: county reports, Buxton (1962).

ISLE OF MAN

100-150 pairs
Calf of Man, 10-15; otherwise no recent information available other than generally known to be plentiful in the northern area and scattered elsewhere; estimate may be minimal.
Habitats: mainly shingle beaches; otherwise rocky shores and cliffs.
Authorities: K. Williamson.

FLINTSHIRE

0-2 pairs
Very doubtful if still breeds; still breeding near Prestatyn in 1953 (two pairs) and at Point of Air up to 1940 at least.
Habitats: sand and shingle beaches.
Authorities: Hardy (1941), P. Hope-Jones, county reports.

DENBIGH

0 pairs
No recorded breeding and nowadays unlikely, due to excessive disturbance.
Authorities: R. Wilson, county reports.

CAERNARVON

60-100 pairs
Bardsey, 40-45; Lleyn Peninsula, from Caernarvon to Portmadoc, 25-50; scarce on north coast — regularly only on Great Orme Head (3-4); but single pairs bred Little Orme and Llanfairfechan in 1964.
Habitats: mainly cliffs and rocky islands; a few still on shingle beaches; once in a disused cliff-top quarry (Little Orme) and once a mile or so inland near Pwllheli.
Authorities: R. Wilson, D. Ager, A. W. Williams, G. E. Thomas, county reports, M.A.F.F. surveys.

ANGLESEY

140-160 pairs
Newborough Warren, 45-50; Cymyran Bay, ca. 20; Alaw Estuary, 10-15; breeds Puffin Island (3-5) and on The Skerries (3); scattered groups and pairs all round coasts; occasionally inland.
Habitats: mainly shingle beaches, sand dunes, low rocky shores and skerries; also saltmarshes and a few in coastal fields up to half mile from shore; a pair on an airfield five miles inland and another on an airfield rubbish dump near shore.
Authorities: M.A.F.F. surveys.

MERIONETH

20-40 pairs
Morfa Harlech, ca. 10; elsewhere thinly distributed with only a few small groups of 2-5 pairs at Aberdovey, Morfa Dyffryn, Fairbourne, and Afon Dysynni.
Habitats: shingle beaches and sand dune areas.
Authorities: W. M. Condry, M.A.F.F. surveys.

CARDIGAN

20-30 pairs
Thinly scattered all down coast from Dovey Estuary to Cardigan Island; probably about one pair per two miles of coast on average.
Habitats: shingle beaches, low rocky shores and cliff bases.
Authorities: W. M. Condry, H. M. Salmon.

PEMBROKE

225-300 pairs
Skomer island, ca. 60; Skokholm island, ca. 50; Ramsey Island, ca. 10; Caldy and St. Margaret's Islands, 5-10; also breeds on remote Grassholm (2-3) and South Bishop rock (1); mainland — probably 100-150 pairs over some 95 miles of coast, mainly N. and W. Pembs. (does not breed Dale peninsula, and probably generally sparse elsewhere in S. Pembs.).
Habitats: virtually confined to rugged islands and mainland cliffs; breeds all over largest islands.
Authorities: M. P. Harris, M.A.F.F. surveys, J. H. Barrett, Sage (1956), J. Donovan.

CARMARTHEN

0-1 pairs
One pair bred Towy Estuary in 1964 — the first breeding record for the county. Ingram and Salmon (1954) state: "The absence of the Oystercatcher, as a breeding species, is remarkable in view of the eminently suitable character of the mainly sandy coast, with considerable dune areas."
Habitats: shingle shores and sand dunes.
Authorities: M.A.F.F. survey, H. M. Salmon.

GLAMORGAN

1-5 pairs
Remnant of a once substantial population in east between Port Talbot and Cardiff — now only 1 or 2 pairs left in Kenfig area (bred Sker Point 1963), may still attempt to breed at Aberthaw and has bred once since 1955 on Sully Is. Rare in Gower Peninsula: a pair bred Whiteford Burrows 1964 and very probably again 1965; only one previous record (*ante* 1939), from Inner Head, opposite Worm's Head.
Habitats: shingle beaches and sand dunes
Authorities: H. M. Salmon, M.A.F.F. surveys, county reports.

MONMOUTH

0 pairs
Formerly bred — a pair on Denny Island prior to 1899.
Authorities: Ingram and Salmon (1963).

SECTION B, NORTHERN ENGLAND (INLAND)

Explanatory notes

(i) Sources of information — (a) writer's observations (M.A.F.F. surveys), 1963-64; (b) local observers, 1965; (c) re-examination of records sent to the British Trust for Ornithology during the inquiry into the inland breeding of the Oystercatcher in 1958 and 1959 (Buxton 1962) and kindly made available to me by the organizer; (d) county reports and regional literature.

(ii) Habitats — nests essentially on gravel beds in rivers and hillstreams; many in nearby pastures and arable fields, often to quarter mile from river banks and occasionally as much as one mile from water (e.g. Coquet valley); a few on rough hillsides and other uncultivated ground; very occasionally on shores and islets of hill reservoirs and on sewage farms; once even on a mainline railway track in Airedale, in 1949.

(iii) Population estimates — numbers of breeding pairs are estimated individually for each river valley or system, together with basic data wherever available; approximate limits and length of each valley occupied by Oystercatchers are noted.

(iv) Authorities — are listed at the end.

YORKSHIRE DALES 45-80 pairs

Airedale (R. Aire): 10-15

Bell Busk down to near Keighley (10 miles); eight pairs in 2-3 miles around Gargrave, 1950, in probably the most favoured area.

Wharfedale (R. Wharfe): 10-15

Halton Gill on tributary R. Skirfare down to Bolton Bridge (20 miles); six pairs in eight miles along Skirfare in 1965.

Nidderdale (R. Nidd): 0

Doubtful breeding; recorded before 1958 but not since.

Wensleydale (R. Ure): 10-20

Above Hawes down to near Ripon (30 miles).

Swaledale (R. Swale): 15-25

Upper reaches down to near Ainderby (30 miles); nine pairs in upper reaches in 1956.

Ryedale (R. Rye): 1-5

Near Hemsley, at least two pairs, 1958-62.

R. Riccal: 0-1

Near Harome, a pair bred 1962.

RIBBLE 30-50 pairs

R. Ribble: 25-35

From near Preston to well above Ribblehead (40 miles); 12-14 pairs along 18 miles between Preston and Skirdon Beck in 1965, i.e. 0·7 pairs/mile average.

R. Hodder: 5-15

From Ribble confluence to just above Stocks Reservoir (20 miles); bred 1965 on tributary R. Loud and near Chipping beside a very small stream (one pair each); breeds on island in reservoir.

WYRE 5-10 pairs

R. Wyre from near Garstang to source at Abbeystead Reservoir (10 miles); 1-2 pairs around Garstang 1965; breeds at reservoir.

R. Brock at least two pairs on this tributary in 1965.

LUNE 40-60 pairs

R. Lune: 30-50

Nr. Caton to beyond Tebay (30 miles); at least 21 pairs in seven miles from Caton to Tunstall in 1963-64, probably the most favoured stretch; pre-breeding assemblies of 70-100 adults occur in early spring in this area; isolated pairs have bred on nearby Killington Reservoir and on a small reservoir near Crook.

R. Wenning: 5-10

From Lune confluence to near source around Austwick (15 miles); at least 5-6 pairs have bred in recent years.

R. Greeta: 1-3

From Lune confluence to just below Ingleton (five miles); at least two pairs have bred in recent years.

R. Rawthey: 1

A pair has bred near Sedbergh in recent years.

EDEN 70-120 pairs

R. Eden: 40-60

From near Carlisle up to Mallerstang (50 miles); averages about one pair/mile of valley; in 1958 ca. 23 pairs recorded over 25 miles; pre-breeding assemblies totalling ca. 100 adults in early spring near Great Salkeld.

R. Petteril: 10-15

From near Carlisle up to near Penrith (15 miles); three pairs breeding near Penrith, 1949-53; no other information.

N.B. A pair bred at Bassenthwaite Lake in 1954, the only recorded breeding in the Lake District to date.

R. Caldew: 1-5

No information; 10 miles long; breeding by 1943.

R. Irthing: 20-40

From Eden confluence up to Gilsland (10 miles); at least 15 pairs in 3-4 miles below Lanercost in 1950.

LYNE 10-20 pairs

R. Lyne, from near confluence with R. Esk up to near headwaters of the White Lyne (20 miles); higher reaches not colonized until 1949; no data available.

TEES/WEAR/DERWENT 1-5 pairs

Apart from a pair which bred ca. 1934 beside R. Team near Kibblesworth none bred in Co. Durham until 1954 when a pair nested on R. Wear; in 1956 two pairs bred R. Derwent; in 1953 a pair had tried to settle in Teesdale near Coniscliffe, but were driven away by gravel-dredging operations; no recent information, but most areas unsuitable and population likely to be very small.

TYNE 40-90 pairs

South Tyne: 20-50

From Corbridge up to Alston area and on some hillstreams, but mainly between Hexham and Haltwhistle (35 miles); at least 10 pairs in 20 miles, 1958.

North Tyne: 10-20

From confluence with S. Tyne up to Falstone at least (20 miles); apparently scarce 1963 though reported in 1958 to be still increasing; no recent information.

R. Rede: 10-20

From confluence with N. Tyne to Otterburn area (15 miles); no recent information but said to be well established on several reaches by 1958.

COQUET 50-75 pairs

R. Coquet, mainly from Rothbury to Alwinton but some up Usway tributary even to Uswayford (20 miles); ca. 30 pairs breed in most favoured stretch of seven miles between Rothbury and Sharperton; some may nest below Rothbury.

ALN 2-5 pairs

R. Aln, breeding only around East and West Bolton; two pairs in 1958.

BREAMISH 10-20 pairs

R. Breamish, from around Ingram down at least to Old Bewick (15 miles) and probably to confluence with R. Till; at least 7-8 pairs over six miles in 1958; not known to breed along R. Till however.

Authorities: Blezard (1954), Buxton (1962), Stokoe (1962), M.A.F.F. surveys, county literature, T. A. Bowbeer, Miss S. D. Brooks, R. Chislett, C. Douglas, E. A. R. Ennion, J. K. Fenton, J. N. Frankland, M. E. Greenhalgh, Miss R. M. T. Grey, Canon G. A. K. Hervey, H. Holgate, W. Howe, Miss C. W. Hull, M. Philipson, A. Pilkington, R. W. Robson, J. E. Ruxton, E. Skinner, G. W. Temperley, A. F. G. Walker, and P. M. Wright.

SECTION C, SCOTLAND (COASTAL)

Explanatory note

The estimates of regional breeding populations are minima only and no attempt is made to determine an upper limit of population level. In general, however, this could well prove to be twice the minimum level given. Relevant geographical and ecological information is outlined.

SHETLAND

1 500 pairs

Breeding on probably ca. 150 of the islands, holms, and skerries which total some 352 000 acres; ca. 100 pairs on Unst (29 930 acres) in 1965; Fair Isle (1920 acres) ca. 45 pairs 1963; Hascosay (750 acres) ca. 45 pairs 1964; breeds even on the Ve Skerries which are less than 7 feet above high-water.

Habitats: mainly sandy and shingle beaches, rocky shores, islets and skerries; less usual on low cliff ledges; now also commonly up to 2 miles from sea on rough hillsides, loch shores, and sometimes on agricultural land.

Authorities: Venables and Venables (1955), Davis (1963), J. Peterson, M. Sinclair, R. J. Tulloch, L. S. V. and U. M. Venables.

ORKNEY

1 500 pairs

Breeding probably on ca. 70 islands (241 000 acres); North Ronaldsay, ca. 120 pairs 1965; Muckle Skerry (100 acres), Pentland Skerries, 15-20 pairs 1963; Eynhallow, 10-15 pairs 1961; there are at least 10 islands larger than N. Ronaldsay and about 35 larger than Muckle Skerry. Also on remotest isles off north coast of Sutherland: North Rona, ca. 20 pairs 1958 (Bagenal and Baird 1959) and Sule Skerry, 30-40 pairs 1904 (Baxter and Rintoul 1953).

Habitats: coastal as in Shetland, but has now extended over whole countryside including many moorland stretches.

Authorities: E. Balfour, K. G. Walker, H. E. Grenfell.

OUTER HEBRIDES

1 000 pairs

Breeding probably on ca. 270 islands and islets; for some of smallest isles recent estimates are available: Flannan Isles, ca. 10 pairs 1960 (Anderson et al. 1961); Monach Isles, ca. 50 pairs 1953-54 (Allan 1955); St. Kilda group, ca. 75 pairs 1963 (Williamson 1964); Pabbay, 11 pairs 1964; Berneray, 20 pairs 1964; Mingulay, 22 pairs 1964.

Habitats: primarily shore-nesting on large islands, otherwise probably more widespread over lesser isles.

Authorities: K. Williamson, Baxter and Rintoul (1953).

INNER HEBRIDES AND CLYDE ISLANDS — 2 000 pairs

Breeding on 30 main islands and probably on at least 200 of the numerous islets and rocks; all literature indicates a very considerable breeding population, although recent declines on Skye and Mull; recent 1962-65 estimates of coastal nesters on five islands average ca. 3 pairs/mile of coastline:— Eigg, ca. 50 pairs (18 miles); Muck, at least 50 pairs (9 miles); Canna, at least 30 pairs (10 miles); Rhum, 10-25 pairs (27 miles); Great Cumbrae, 30-50 pairs (10 miles); but Skye, ca. 100 pairs (340 miles) apparently exceptional due to marked decrease. R. N. Campbell and C. E. Palmar consider average density at least one pair/mile of coast.

Estimate based on total coastline length of ca. 960 miles (excluding Skye) and two pairs/mile average.

Habitats: coastal except usually on smaller and lower lying islands (e.g. Coll, Tiree) where breeds also on moorland well inland; even up to 1 000 ft on Islay.

Authorities: R. N. Campbell, C. E. Palmar, T. Bagenal, S. Gordon, P. R. Evans, Baxter and Rintoul (1953), Boyd (1958), Gibson and Gordon (1953), Meiklejohn and Stanford (1954).

MAINLAND: WEST AND NORTH COASTS (Solway Firth to Ross and Cromarty) — 4 000 pairs

Breeding along virtually the entire 1 950 miles of coast, except where cliffs are too sheer, but probably least numerous in Ayrshire and well up the Firth of Clyde; Caerlaverock Merse, 30-50 pairs along four miles of Solway saltmarshes; Caithness, 40-50 pairs along typical nine miles of rocky coast west of Brims Ness, i.e. ca. 500 pairs around entire 90 mile coastline (D. M. Stark); all literature and observers imply a very considerable population; at least averaging one pair per mile all up west coast (R. N. Campbell).

Estimate based on two pairs/mile average.

Habitats: mainly shingle beaches and low rocky shores, but also on rocks beneath high cliffs; saltmarshes in Solway area; locally on sandy shores; penetrate far up long sea-lochs.

Authorities: R. N. Campbell, P. A. Burtt, I. D. Pennie, D. M. Stark, L. Roberts, Baxter and Rintoul (1953).

MAINLAND: EAST COAST (Moray Firth to Berwick) — 125 pairs

Generally scarce and particularly so in south-east; on Moray Firth coast breeds rather thinly from around Whiteness Head eastwards through Nairn and Morayshire, and presumably also in Banff and northern Aberdeenshire; isolated concentration of ca. 35 pairs at Sands of Forvie is unique for this coast; very doubtfully breeds southern Aberdeenshire and Kincardine coasts; absent from Angus and mainland of Fife; 20-25 pairs on Forth islands (Isle of May 11-15, Fidra 5-6, Inchkeith 2, Inchmickery 1, and Craigleith 1 occasionally); has recently bred East Lothian

MAINLAND: EAST COAST
(Moray Firth to Berwick)

at two sites; presumably breeds (1-10 pairs) on short Berwickshire coast adjoining the Northumberland population. Estimate based on known population (ca. 60 pairs) and allowing 0·5 pair/mile for 115 miles of coast from Whiteness Head to Forvie, and 18 miles in Berwick. Upper limit not likely to exceed 250 pairs.

Habitats: sand dunes (Forvie), rocky islets (Firth of Forth), sandy and shingle beaches, and presumably also low rocky shores (Moray Firth).

Authorities: Baxter and Rintoul (1953), H. Boase, G. Dick, Eggeling (1956), Grierson (1962), R. Richter, Dr. Maeve Rusk, R. W. J. Smith.

SECTION D, SCOTLAND (INLAND)

Explanatory notes

Estimates of regional populations are minima only and, although likely orders of magnitude are indicated, no attempt is made to determine an upper limit of population level. Relevant geographical and ecological information is outlined. Breeding localities are far too numerous to mention individually. The sources of information are as in section 'B'.

EASTERN HIGHLANDS

1 500 pairs

Very widespread distribution over the area north and east of a line linking Inverness, Loch Lomond and Loch Leven; western limits bounded by Inverness, L. Ruthven, headwaters of R. Findhorn, L. Laggan, L. Eigheach, Crianlarich, and L. Lomond islands; southern limits by southern end L. Lomond, Forth Valley, Stirling, Clackmannan, L. Leven area, Perth, Sidlaw Hills, and eastern Strathmore. Apparently seldom breeds very close to coast in Fife, Perth, Angus and Kincardine, whereas from Aberdeen to Inverness breeds commonly within two or three miles of shore. Generally much more abundant in N.E. than in S.W. part of this region. Outlying pairs known to breed beyond western boundary only at southern end of Great Glen (by R. Lochy and R. Spean) and on R. Orchy near L. Tulla, but commonly around L. Awe in Argyll.

Breeding along at least 1 000 miles of rivers. Estimate based on M.A.F.F. (1963–65) surveys of 24 waters which showed average of 1·5 pairs per mile along river banks only (740 pairs in 480 miles). There is much evidence suggesting that at least a similar number must breed more than ¼ mile away from rivers.

Habitats: low, rolling, agricultural land near coast; shingle beds and farmland along virtually all rivers and extending up onto moorland and rough hillsides near their sources; ascends tributaries frequently to 1 500 ft but has bred at 2 000 ft and been seen at over 3 000 ft in Grampians; by many hill lochs; often far from water on farmland; occasionally in and around diffuse woodland and clearings.

Authorities: Baxter and Rintoul (1953), Yeates (1948), M.A.F.F. surveys, Dr. Maeve Rusk, R. Richter, D. Jenkins, G. Dick, Miss V. Thom, H. Boase, J. Goss-Custard.

NORTHERN SCOTLAND

900 pairs

Essentially Caithness, east half of Sutherland, Easter Ross and extreme north-west Inverness-shire; western limits bounded by Loch Loyal, Altnaharra, L. Shin, upper Strath Oykell, S. Carron, and Achnasheen (S. Bran); southern limits by upper S. Connon, S. Glass, and Glen Convinth, near Beauly. Outlying pairs known to breed beyond western boundary, in Sutherland only, on L. Stack, L. Assynt, and some small lochs near coast at Durness and, in Wester Ross, only on the river at Kinlochewe. Breeds throughout interior of Caithness—at least 500 pairs (D. M. Stark). In Sutherland, >100 pairs, scattered and often widely separated; breeding

NORTHERN SCOTLAND

along ca. 100 miles of rivers at average of 0·75 pairs per mile in 1964 (30 pairs in 42 miles—M.A.F.F. survey) with smaller numbers by hill lochs and away from rivers. In E. Ross at least 250 pairs (D. H. Mills) by rivers and on coastal farmland. In N.W. Inverness ca. 50 pairs, breeding along ca. 25 miles of rivers at average of two pairs/mile in 1964 (20 pairs in 9 miles—M.A.F.F. survey).

Very doubtful if maximum population for this region exceeds 1 500 pairs.

Habitats: as Eastern Highlands though generally much more restricted to lower cultivated ground and to proximity of rivers and lochs by the wilder, more rugged nature of the country; breeds up to ca. 700 ft in Sutherland but usually well below 500 ft.

Authorities: Baxter and Rintoul (1953), Pennie (1962), M.A.F.F. survey, R. N. Campbell, E. G. Holt, D. H. Mills, I. D. Pennie, Dr. Maeve Rusk, D. M. Stark.

SOUTHERN SCOTLAND 500 pairs

Widely distributed south of a line linking Girvan (Ayrshire) with Penicuik (Midlothian) and Berwick; northern limits bounded by R. Stinchar, headwaters of R. Nith, Duneaton Water—a Clyde tributary, upper Tweeddale, Edinburgh reservoirs in the Pentland and Moorfoot Hills and, in the east, by Whiteadder Water and by Coldstrea... in the lower valley of R. Tweed. Most numerous in south-west, less so east of R. Annan, and noticeably scarce in north-east in Roxburgh, Berwick, and East Lothian. Not as a rule very close to coasts except in Solway Firth area. Has rarely been known to breed north of this range, but nested at a reservoir in east Renfrewshire several times between 1938 and 1949 and once, not far away, by R. Clyde at Hamilton in 1955.

Breeds along ca. 350 miles of rivers. Estimate based on M.A.F.F. (1963–65) surveys of 14 waters which showed average of 1·3 pairs per mile of river banks only (250 pairs in 190 miles). Only relatively small numbers breed well away from rivers in this region. In the Lothians only 20–25 pairs breed (R. W. J. Smith). Very doubtful if maximum population level exceeds 750–1 000 pairs in the region.

Habitats: as Eastern Highlands but much more restricted to vicinity of rivers, lochs, and reservoirs except in parts of Galloway and Dumfries-shire; breeds up to ca. 1 000 ft but usually below 500 ft.

Authorities: Baxter and Rintoul (1953), Gibson (1955 and 1957), Buxton (1962), Medlicott (1963), M.A.F.F. surveys, L. Roberts, R. W. J. Smith.

SECTION E, IRELAND (COASTAL)

Explanatory note

The estimates for coastal breeding populations are minima only except for the south and east coasts, where numbers are small enough to permit a reasonable determination of an upper population level. Relevant geographical and ecological information is outlined.

WEST, NORTH AND NORTH-EAST 4 000 pairs

Breeds along ca. 1 750 miles of coast from west Cork, near Cape Clear Island, around to and including Co. Down, and up Shannon Estuary at least to Foynes; also on probably at least 350 islands. All literature indicates high abundance on these coasts and islands, and this is confirmed by D. B. Cabot who considers overall population exceeds an average of 1–2 pairs per mile of coastline, with exception of Sligo where apparently scarce or absent on mainland though breeding on islands of Ardboline and Inishmurray (20 pr. at least). Other recent small island estimates are:— Cape Clear 11 pr; Roaninish 13 pr Tory ca. 6 pr; Strangford Lough, 67 nests on 35 islands in June 1949; The Mullett, ca. 100 pr. Estimate based on allowance of two pairs/mile of coast, excluding Sligo, and two pairs per island.

Habitats: chiefly marine islands and innumerable islets in bays and sea loughs where nests on shingle, rocks, turf, and cliff-top fields; abundant also on rocky mainland shores but rarely there on shingle beaches; smaller numbers in estuaries.

Authorities: Ussher and Warren (1900), Kennedy et al. (1954), Deane (1954); David Cabot, R. F. Ruttledge, N. Murphy, J. L. F. Parslow.

EAST AND SOUTH 150–250 pairs

Breeds only at a few widely scattered localities from Co. Louth to Cork, chiefly in Dublin and Wexford; doubtfully breeds Louth though has bred Dunany Point at least ten years ago; absent from Meath; common in Dublin on coast and islands (ca. 100 pairs); scarce in Wicklow where perhaps up to 20 pairs between Newcastle and Kilcoole; common in extreme south-east Wexford from Wexford Harbour to Tacumshin Lake (40–75 pairs) with a further 10–15 pairs on the Saltee and Keeragh islands —otherwise absent from county; breeds Co. Waterford only in Dungarvan Harbour, probably under 10 pairs; absent from much of Cork, certainly so east from Clonakilty, but breeds in Cape Clear area and further west.

Habitats: small islands, salt-marshes, sandy and shingle beaches.

Authorities: Kennedy (1961), David Cabot, R. F. Ruttledge, W. J. O'Flynn, J. L. F. Parslow.

SECTION F, IRELAND (INLAND)

5–15 pairs
Rare; regular breeding confined to Lough Beg (up to three pairs annually) and L. Neagh (numbers unknown but apparently under 10 pairs) in north-east Ireland, some 15 to 25 miles from coast.
Prior to 1900 had bred inland also in the north-west, at L. Erne and possibly at L. Arrow too.
Habitats: presumably islands.
Authorities: Kennedy et al. (1954), R. F. Ruttledge, T. Ennis.

APPENDIX III: DISTRIBUTION OF THE BRITISH WINTERING POPULATION OF OYSTERCATCHERS, 1963–65

COUNTY AND REGIONAL DATA

For each county or region the relevant data on which the population estimates have been based are presented in the following order:

(i) the probable overall limits of the Oystercatcher population during the mid-winter period, December–January, for the two winters 1963–64 and 1964–65;

(ii) the usual population limits for those haunts regularly supporting more than 100 birds, together with a brief outline of the status elsewhere in the county or region;

(iii) habitat notes;

(iv) sources of information, e.g. annual reports of county ornithological societies, names of local observers (pers. comms.), surveys (='M.A.F.F. surveys') made by the writer and his colleagues.

Note: In many areas greater numbers frequently occur during the autumn migration period, mid-July to mid-November, and occasionally also during the reverse spring movement, February to May.

ENGLAND AND WALES

CORNWALL

1 000–2 500

Scilly Isles, flocks totalling 500–1 000. Mainland, no regular flocks exceeding 100; south coast total 500–1 000; north coast total 100–500.

Habitats: narrow meandering muddy estuaries, open sandy beaches and bays, rocky shores; coast generally exposed to heavy surf; small numbers (20–30) regularly in coastal fields at Par, and occasionally elsewhere.

Authorities: J. E. Beckerlegge, R. Khan, C. J. Stevens, J. L. F. Parslow, M.A.F.F. surveys.

DEVON

2 500–5 000

Exe Est., 1 500–2 500; Taw–Torridge Est., 500–1 000; Teign Est., 200–300; small flocks 50–100 regularly in Kingsbridge, Plym, and Tamar–Tavy estuaries, and at Wembury; elsewhere widely scattered groups.

Habitats: primarily mussel beds in three main haunts; otherwise muddy estuaries and open rocky shores.

Authorities: county reports, M.A.F.F. surveys.

SOMERSET

250–500

Bridgewater Bay, 100–200 in total; elsewhere smaller flocks in Weston and Sand Bays and up to 150 on Minehead–Dunster beach regularly.

Habitats: sand-mud flats, stony beaches in western area; small numbers regularly in fields around Weston-super-Mare.

Authorities: county reports, M.A.F.F. survey.

GLOUCESTER

0–50
Occasional ones or twos up Severn Estuary as far as Frampton.
Habitats: estuarine mud and ooze; unsuitable.
Authorities: county reports.

DORSET

250–500
Poole Harbour, 150–250 normally; scarce elsewhere.
Habitats: primarily sand flats and muddy areas of natural 'harbour'.
Authorities: county reports.

HAMPSHIRE

500–1 500
Langstone Harbour, 100–400; Western Solent, flocks totalling 250–400 around Beaulieu and Lymington river mouths; Southampton Water, flocks totalling 150–300 around Hamble River, Dibden Bay and Titchfield Haven; elsewhere only small parties in Christchurch Harbour and around Isle of Wight.
Habitats: essentially estuarine, mud-flats, and gravelly shores.
Authorities: county reports, Cohen (1963).

SUSSEX

500–1 000
Chichester Harbour, 300–600 (but 1 700 in January 1964); Pagham Harbour, 100–150; Rother Estuary, 100–250; elsewhere extremely scarce. Probably much interchange between flocks in the three harbours on the Sussex/Hampshire border.
Habitats: primarily sheltered mud and sand flats in natural 'harbours'; open coast very unsuitable with narrow shingly shores.
Authorities: county reports, M. Shrubb.

KENT

2 500–3 500
Swale Est., 2 000–2 500 (from 1955–58 between 3 000 and 4 500 wintered); Pegwell Bay, 300–500 (but 700 temporarily, February 1963, in severe weather). Elsewhere, small flocks up to 100 in Dungeness area (where 1 500 occurred exceptionally in severe weather of January/February, 1963) and up to 200 in Medway Estuary. Occasionally up Thames Estuary to Cliffe.
Habitats: mainly sand flats around mouth of Swale and in Pegwell Bay; otherwise muddy estuarine shores.
Authorities: county reports.

ESSEX

2 500–3 500
Foulness Point, 2 000–3 000; Blackwater Estuary, 100–250; elsewhere, up to 100 in Hamford Water, otherwise only small parties. A few occur up Thames Estuary to East Tilbury.
Habitats: primarily sand-flats; otherwise estuarine mud-flats and creeks.
Authorities: county reports.

SUFFOLK

100–250
Generally scarce on unsuitable coast; small parties up to 50 in few estuarine haunts.
Habitats: estuarine mud-flats and creeks; open shore shingly and unfavourable.
Authorities: county reports, G. B. G. Benson.

NORFOLK

5 000–10 000
The Wash, east side, 4 000–7 500; Brancaster and Wells Harbours, 400–900 each; Blakeney Harbour, 300–500; elsewhere, scarce in east Norfolk. Occasional influxes into the harbours occur apparently as temporary outliers from The Wash flocks.
Habitats: extensive sand-flats with cockle beds; locally mussel scars; scarce on open sandy and shingly beaches exposed to strong wave action.
Authorities: county reports, M.A.F.F. surveys.

LINCOLNSHIRE

1 500–4 500
The Wash, west and south sides, 1 500–4 000; between Saltfleet and North Coates, small flocks totalling 100–400; scarce elsewhere on open coast.
Habitats: extensive sand-flats with cockle beds and occasional mussel beds; scarce on exposed sandy beaches.
Authorities: county reports, M.A.F.F. surveys.
N.B. The total Wash population is difficult to assess accurately owing to occasional local movements from side to side as well as to and from the Norfolk harbours, but its limits appear to be 5 500–11 500; from 7 000–10 000 is probably a normal level. Complete censuses of The Wash flocks gave totals of 4 350 in January 1957, 9 850 in January 1958, and 10 780 in February 1961.
Authorities: Ballance and Scott (1959), county reports, G. M. S. Easy.

YORKSHIRE/DURHAM

500–1 000
Tees Estuary, 500–700; Humber Estuary, up to 100 at Spurn; very scarce on open coast south of Saltburn and north of Teesmouth.
Habitats: mainly sand-flats; low rocky shores in north Yorkshire; elsewhere, open coast too precipitous or otherwise exposed and virtually barren.
Authorities: county reports, Stead (1964).

NORTHUMBERLAND

500–1 000
Fenham Flats and Budle Bay area, 300–500; elsewhere only very scattered small flocks.
Habitats: mainly sand-flats; otherwise low rocky shores on the exposed coast with intervening beaches.
Authorities: county reports, P. R. Evans.

CUMBERLAND

8 000–12 000
Solway Firth (Allonby to Port Carlisle) 5 500–7 000; Duddon Estuary*, 1 000–2 000; Esk Estuary, 500–700; elsewhere scattered small flocks along open shores.
Habitats: extensive sand-flats and mussel scars; hundreds may feed daily in coastal fields beside the Solway Firth, with small numbers elsewhere.
Authorities: M.A.F.F. surveys, A. B. Warburton.
* Here considered to be entirely in Cumberland although on the Lancashire border.

SOLWAY FIRTH:

12 000–18 000 total population.
From three M.A.F.F. surveys in late January and early February of 1963, 1964, and 1965. Flocks totalled 5 500–7 000 on Cumberland shore and 6 000–11 000 on Scottish shore, between Torduff Point and Rough Firth.
Habitats: extensive sand-flats and mussel scars; small flocks on muddy-gravelly shores and in coastal fields.

ISLE OF MAN

500–1 000
No information available; writer's estimate based on examination of maps; only small scattered flocks to be expected.
Habitats: generally open sandy and shingly beaches and low reefs; much of coast precipitous and unsuitable.

LANCASHIRE

13 000–17 000
Morecambe Bay* (Walney Is. to R. Wyre), 12 000–15 000; Ribble Estuary (Formby Point to Lytham St. Annes), 1 000–2 000; Duddon Estuary (see Cumberland).
Habitats: extensive sand-flats, cockle beds and mussel scars; hundreds feed in coastal fields around Morecambe Bay.
* Based on M.A.F.F. surveys during 1963–64 and 1964–65 winters.

CHESHIRE/FLINTSHIRE

3 000–5 000
Dee Estuary (Hoylake to Rhyl), 3 000–5 000; Mersey Estuary, very small numbers only.
Habitats: sand-flats with cockle beds and mussel scars; small flocks feeding in coastal fields and in the Wirral.
Authorities: E. White and J. C. Gittins.

DENBIGH

500–1 000
Rhos Point, 500–800; elsewhere scattered very small flocks.
Habitats: primarily mussel scars; small flocks in coastal fields sometimes.
Authorities: R. Wilson, Miss B. Machin, M.A.F.F. surveys.

CAERNARVON 3 000–5 000

Conway Bay, 2 500–3 500 (comprising two distinct flocks of 1 000–1 500 at Conway, and 1 500–2 000 on Lavan Sands); Glaslyn Estuary, 200–500; elsewhere scattered small flocks in Foryd Bay etc.

Habitats: sand-flats and mussel scars; small flocks regularly feed in coastal fields between Conway and Bangor.

Authorities: M.A.F.F. surveys.

ANGLESEY 1 000–2 000

Red Wharf Bay, 350–750; Traeth Melynog, 150–200; Llanddwyn Bay, 100–200; Cefni Estuary, 100–200; Beaumaris, 100–150; Beddmanarch Bay, 100–150; elsewhere very small and widely scattered flocks.

Habitats: mainly sandy sheltered bays and inlets; also mussel scars and low rocky shores; small flocks sometimes in coastal fields.

Authorities: M.A.F.F. surveys.

MERIONETH/CARDIGAN 1 000–2 000

Dovey Estuary, 150–400; Mawddach Estuary, 100–300; elsewhere small flocks probably at frequent intervals along Cardigan coast, but no information available.

Habitats: sandy estuaries; low rocky shores in Cardigan; exposed sandy and shingle beaches in Merioneth are unsuitable.

Authorities: M.A.F.F. surveys.

PEMBROKE 250–500

Saundersfoot Bay, 100–250; Milford Haven, 100–150; scarce elsewhere.

Habitats: more sheltered sandy-muddy bays and inlets; otherwise coast precipitous and generally unsuitable, with surf-pounded sandy beaches and rocky shores.

Authorities: M.A.F.F. surveys.

CARMARTHEN/GLAMORGAN (Gower) 9 000–16 000

Burry Inlet, 3 000–14 000; Taf, Towy, and Gwendraeth Estuaries, flocks totalling 1 000–6 000; elsewhere only very small flocks on south coast of Gower Peninsula and in west Carmarthen.

Interchanges between two main haunts occur occasionally, especially at times of local food shortage, e.g. 1963–64 winter. Normal levels are:— Burry Inlet, 8 500–14 000 (fell to 3 000–4 000 during 1963–64 winter); Taf, Towy, and Gwendraeth complex, 1 000–2 000 (but 3 000–5 000 in 1963–64, and part of 1964–65 winters.)

Habitats: sandy estuaries with extensive cockle beds; small flocks locally on mussel scars; elsewhere coast too precipitous or with exposed barren beaches.

Authorities: M.A.F.F. surveys, Davidson (in press.).

GLAMORGAN (except Gower) 500–1 000

Swansea Bay, 150–300; elsewhere in east Glamorgan small scattered flocks only.
Habitats: sandy beaches and low rocky shores; small flock feeds regularly in coastal fields at Black Pill in Swansea.
Authorities: M.A.F.F. surveys, county reports.

MONMOUTH 100–250

Scattered small parties along the Severn shores.
Habitats: estuarine mud and ooze; unsuitable.
Authorities: Ingram and Salmon (1963).

SCOTLAND

BERWICK

100–500

No information available; writer's estimate based on examination of maps; only scattered small flocks to be expected.

Habitats: exposed rocky coast, precipitous in places; ca. 20 miles long.

FIRTH OF FORTH

3 000–4 000

Scattered population, confined virtually to the approaches to the firth; no very large flocks occur, largest being 500–1 000. Distribution:

(i) Southern approaches (Tynninghame to South Queensferry), 2 000–2 500. Suitable shores up to Musselburgh, generally unsuitable beyond; flocks at Musselburgh (600–700), Aberlady and Gosford Bays (600–700), and Tynninghame (400–500); elsewhere only small parties.

(ii) Northern approaches (Fife Ness to North Queensferry), 700–1 200. Much unsuitable and industrialized shoreline; main haunt is Burntisland sands (600–1 000).

(iii) Upper firth (above Queensferry), 200–300. Small scattered flocks; unsuitable with estuarine mud and low reefs.

Habitats: flocks primarily on mussel scars and in outer sandy bays; only small numbers on extensive mud-flats and narrow rocky shores.

Authorities: G. Dick, R. W. J. Smith, M.A.F.F. survey.

FIRTH OF TAY

2 000–6 000

Scattered population, confined virtually to wide approaches to the firth; large flocks have occurred in Eden Estuary. Distribution:

(i) Southern approaches (Fife Ness to Tayport), 1 500–5 000. Eden Estuary, 1 500–5 000 wintered 1950–55 and large numbers may still occur; Tayport, 300–700; elsewhere only small scattered flocks on open rocky Fife coast.

(ii) Northern approaches (Arbroath to Broughty Ferry), 500–1 000. Small flocks up to 300 around Carnoustie and Arbroath, and a few elsewhere; shores generally favourable.

(iii) Upper firth (above Dundee), 50–200. Small flock regularly only in Invergowrie Bay; haunt unsuitable with estuarine mud and ooze.

Habitats: primarily sand-flats and beaches; mussel scars; small numbers only on rocky shores, mud, and in coastal fields.

Authorities: H. Boase, G. Dick, Miss V. Thom, Grierson (1962) and M.A.F.F. survey.

NORTH-EAST COAST
(Arbroath to Lossiemouth)

2 000–3 500

Montrose Basin, 1 000–2 000; Ythan Estuary, 200–300; elsewhere a very thin scattering along ca. 150 miles of exposed rocky coastline and 'barren' surf-pounded beaches, probably 500–1 000.

Habitats: mainly mussel scars in estuaries and more sheltered sand-mud flats of Montrose Basin; small flocks frequently in coastal fields in N. Aberdeenshire.
Authorities: M.A.F.F. survey, J. Goss-Custard.

MORAY FIRTH 5 500–9 000

Dornoch Firth and Loch Fleet, 2 000–3 500; Cromarty Firth, 1 500–2 500; Moray Firth, southern side (Fort George to Lossiemouth), 1 500–2 000; Inverness Firth, 500–750; Beauly Firth, 100–250. Main concentrations occur in outer parts of Dornoch and Cromarty Firths and between Whiteness Head and Findhorn Bay.
Habitats: more sheltered sand-flats in and around entrances to firths; small flocks only on muddy, stony grounds, and scarcer still on ooze in upper firths and on exposed sandy beaches and rocky shores.
Authorities: M.A.F.F. survey, I. D. Pennie and Dr. Maeve Rusk.

SUTHERLAND/CAITHNESS 2 000–4 000

Kyles of Tongue and Durness, 250–500; Sandside Bay, 100–200; Dunnet Bay, 50–200; elsewhere only in very small and scattered flocks around ca. 340 miles of exposed and usually precipitous coastline. No data available for most of coast and estimate is based largely upon examination of maps. (Note—Dornoch Firth and L. Fleet, Sutherland, are not included here but under 'Moray Firth', q.v.).
Habitats: primarily sandy bays and sea-lochs; otherwise rocky shores.
Authorities: I. D. Pennie, D. M. Stark.

ORKNEY/SHETLAND 500–1 000

Majority in Orkney in sandy bays; very scattered in very small flocks. No data available; estimate based upon literature and examination of maps. Formerly rare in winter.
Habitats: probably sandy bays primarily; also rocky shores and agricultural land in Shetland; much of coast is rugged and storm-bound in winter.
Authorities: Venables and Venables (1955), Davis (1963).

OUTER HEBRIDES 500–1 000

No information available except that Oystercatcher is almost entirely a summer visitor to the Western Isles; small flocks presumably winter in sandy bays and tidal lagoons on North Uist, Benbecula, and at a few other places; elsewhere coasts are storm-bound and unsuitable; estimate based on examination of maps.
Habitats: probably sheltered sand-flats mainly.
Authorities: Baxter and Rintoul (1953).

INNER HEBRIDES

1 000–2 000

No information available except that Oystercatcher is almost entirely a summer visitor to Western Isles; small flocks presumably winter in sandy bays and inlets but apparently very scarce on predominantly rugged and exposed coasts. Estimate based on examination of maps.

Habitats: primarily sandy bays and beaches.

Authorities: Baxter and Rintoul (1953), Boyd (1958), S. Gordon.

WEST COAST (Wester Ross to Firth of Clyde)

2 500–5 000

Little information available; estimates based on sparse literature and writer's examination of maps and limited personal experience. Firth of Clyde, 1 000–2 000 (Fairlie Sands 500–750, Ayr/Irvine Bays 500–750); Argyll coast, 1 000–1 500; Inverness coast, 100–500; Wester Ross, 500–1 000. North of Clyde west coast generally unsuitable, being rocky with narrow stony or gravelly beaches, and only a few small sandy-muddy haunts in sheltered bays and at the heads of the long sea-lochs; flocks probably very small and population diffuse. Higher reaches of Firth of Clyde similar, but in addition also industrialized. Much of south Ayrshire coast unsuitable, being rocky or stony, but sandy beaches and flats from Ayr Bay north to Fairlie hold largest flocks.

Habitats: mainly sandy bays; very small numbers elsewhere.

Authorities: Baxter and Rintoul (1953), M.A.F.F. survey (Ayrshire).

SOUTH-WEST COAST (Galloway and Solway Firth)

7 000–13 500

Solway Firth* (Torduff Point to Rough Firth), 6 000–11 000; Wigtown Bay, 500–1 000; Loch Ryan, 500–1 000; Kirkcudbright Bay, 100–250; Sands of Luce, 100–250; scarce elsewhere on precipitous sectors of coast.

Habitats: extensive sand-banks of Solway, sandy bays and mussel scars; small flocks on muddier shores; coastal fields around Solway Firth and Wigtownshire; scarce on rocky or stony shores.

Authorities: M.A.F.F. surveys.

* For total Solway population, refer to Cumberland.

IRELAND

The information for Ireland is based almost entirely on a single survey of all the main haunts made by the writer in December 1965. Because of this, and a paucity of local observers and published records, rather wide population limits are given.

EAST COAST (Fair Head, Antrim, to Carnsore Pt., Wexford)

6 000–15 000

Population mainly in sandy bays and inlets between Dublin and Belfast; elsewhere coast generally unsuitable with narrow rocky shores, or long stretches of open and barren sand or shingle beaches.

Belfast Lough, 1 000–2 500; Strangford Lough, 1 000–2 500; Dundalk Bay, 1 000–2 500; Dublin Bay, 1 000–2 500; Dundrum Bay, 500–1 000; Wexford Harbour, 500–1 000; Carlingford Lough, 100–500; Malahide Harbour, 100–500; Baldoyle Harbour, 100–500; probably no more than 500–1 000 thinly scattered along open coast.

Habitats: primarily sheltered sandier bays; locally on mussel scars; scarce in soft muddy parts of Strangford Lough and on exposed shores.

Authorities: M.A.F.F. survey, David Cabot, R. F. Ruttledge.

SOUTH COAST (Carnsore Pt., Wexford, to Mizen Head, Cork)

2 000–5 000

Coast mostly unsuitable, being rocky and indented with predominantly muddy estuaries and harbours and a few sandy but exposed beaches; no large flocks.

Cork Harbour, 500–1 000; Courtmacsherry Estuary, 100–500; Tramore Bay, 100–500; Waterford Harbour, 100–500; Bannow Bay, 100–500; Tacumshin Lake, 100–500; (Clonakilty Estuaries, Youghal Estuary, and Dungarvan Harbour, each 50–100); probably 500–1 000 scattered along open coast.

Habitats: mainly soft estuarine mud and ooze; small sandy inlets; coastal fields near Cork and Youghal.

Authorities: M.A.F.F. survey, W. J. O'Flynn, David Cabot.

WEST COAST (Mizen Head, Cork, to Bloody Foreland, Donegal)

2 000–4 000

Coast very rugged, highly indented and exposed to the Atlantic storms with some long stretches of surf-pounded sands; even many of the sheltered bays and estuaries are unsuitable, being either of coarse 'barren' sands or soft mud.

Castlemaine Harbour, 500–1 000; Shannon Estuary, 100–500; Sligo Bay, 100–500; elsewhere probably no more than 1 000–2 000 very thinly scattered.

Habitats: the more sheltered sandy bays; small mussel scars; otherwise muddy estuaries and creeks; scarce on exposed shores.
Authorities: M.A.F.F. survey, David Cabot, R. F. Ruttledge.

NORTH COAST (Bloody Foreland, Donegal, to Fair Head, Antrim) 2 000–4 000

Coast very rugged and indented in Donegal, much less so in Derry and Antrim; main wintering grounds are in two large sheltered sea loughs. Lough Foyle, 1 000–2 500; Lough Swilly, 500–1 000; probably ca. 500 scattered elsewhere, mainly in the sandy inlets of N. Donegal.
Habitats: muddy sand-flats in sheltered bays; very few on rocky or stony shores.
Authorities: M.A.F.F. survey, David Cabot.

APPENDIX IV: THE MAIN WINTERING HAUNTS OF OYSTERCATCHERS IN THE BRITISH ISLES, 1963–65

The basic data from which the distribution map (Fig. 2) has been constructed are given below. All known haunts regularly holding more than 100 Oystercatchers in winter are listed within six size categories. For the 21 most important haunts, holding more than 1 000 birds, the usual population limits and the approximate median population levels are tabulated. These values have been derived from the county and regional data presented in Appendix III. In the last column the median population level of each haunt is expressed as a percentage of the national median population level. It must be appreciated that because of many imperfections in the data sources the quoted population figures, and especially the percentages, should be regarded as general orders of magnitude rather than precise population values. Haunts holding less than 1 000 Oystercatchers can only be listed in approximate descending order of importance.

	Haunts	Usual population limits Minimum	Maximum	Approx. median population level	% of total	
BRITISH ISLES		95 000	175 000	135 000		
I.	10 000–20 000					
	Solway Firth	12 000	18 000	15 000	11·1	
	Morecambe Bay	12 000	15 000	13 500	10·0	
	Burry Estuary area	9 000	16 000	12 500	9·3	
						30·4
II.	5 000–10 000					
	The Wash	5 500	11 500	8 000	5·9	
III.	2 500–5 000					
	Moray and Cromarty Firths	3 500	5 500	4 500	3·3	
	Dee Estuary	3 000	5 000	4 000	3·0	
	Firth of Tay	2 000	6 000	4 000	3·0	
	Firth of Forth	3 000	4 000	3 500	2·6	
	Dornoch Firth (with L. Fleet)	2 000	3 500	3 000	2·2	
	Conway Bay	2 500	3 500	3 000	2·2	
						16·3
IV.	1 000–2 500					
	Foulness, Essex	2 000	3 000	2 500	1·9	
	Swale Estuary, Kent	2 000	2 500	2 250	1·7	
	Exe Estuary, Devon	1 500	2 500	2 000	1·5	
	Montrose Basin, Angus	1 000	2 000	1 500	1·1	
	Duddon Estuary, Lancashire	1 000	2 000	1 500	1·1	
	Ribble Estuary, Lancashire	1 000	2 000	1 500	1·1	

Lough Foyle, Derry	1 000	2 000	1 500	1·1
Belfast Lough, Antrim/Down	1 000	2 000	1 500	1·1
Strangford Lough, Down	1 000	2 000	1 500	1·1
Dundalk Bay, Louth	1 000	2 000	1 500	1·1
Dublin Bay, Dublin	1 000	2 000	1 500	1·1
				13·9

V. 500–1 000

Lough Swilly, Donegal
Taw–Torridge Estuary, Devon
Cork Harbour, Cork
Wigton Bay, Galloway
Wexford Harbour, Wexford
Loch Ryan, Wigtownshire
Brancaster Harbour, Norfolk
Dundrum Bay, Down
Wells Harbour, Norfolk
Rhos Point, Denbighshire
Castlemaine Harbour, Kerry
Fairlie Sands, Ayrshire
Tees Estuary, Yorkshire/Durham
Esk Estuary, Cumberland

VI. 100–500

Red Wharf Bay, Anglesey; Pegwell Bay, Kent; Chichester Harbour, Sussex; Blakeney Harbour, Norfolk; Sligo Bay, Sligo; Fenham Flats, Northumberland; Kyle of Tongue, Sutherland; Glaslyn Estuary, Caerns./Merioneth; Kyle of Durness, Sutherland; West Solent, Hants.; Tynninghame Sands, E. Lothian; Ayr Bay, Ayrshire; Dovey Estuary, Cards./Merioneth; Teign Estuary, Devon; Ythan Estuary, Aberdeenshire; Langstone Harbour, Hants.; Swansea Bay, Glamorgan; Baldoyle Harbour, Dublin; Tramore Bay, Waterford; Mawddach Estuary, Merioneth; Poole Harbour, Dorset; Malahide Harbour, Dublin; Bannow Bay, Wexford; Southampton Water, Hants.; Humber Estuary, Yorks./Lincs.; Sands of Luce, Wigtownshire; Irvine Bay, Ayrshire; Shannon Estuary, Clare/Limerick; Kirkcudbright Bay, Kirkcudbrightshire; Saundersfoot Bay, Pembrokeshire; Waterford Harbour, Wexford/Waterford; Cefni Estuary, Anglesey; Llanddwyn Bay, Anglesey; Courtmacsherry Estuary, Cork; Traeth Melynog, Anglesey; Blackwater Estuary, Essex Sandside Bay, Caithness; Rother Estuary, Sussex; Minehead–Dunster beach, Somerset; Bridgewater Bay, Somerset; Pagham Harbour, Sussex; Beddmanarch Bay, Anglesey; Milford Haven Pembrokeshire; Carlingford Lough, Down/Louth; Tacumshin Lake, Wexford.

Printed in England for Her Majesty's Stationery Office by W. A. SMITH (Leeds) LTD.

Dd. 127015 K8 8/66